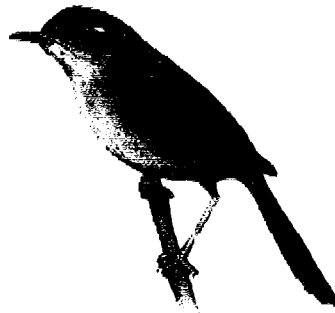


**Distribution and Habitat Preference of Grey Crowned  
Prinia (*Prinia cinerocapilla*) in Bardia, Kailali and  
Kanchanpur Districts of Nepal**

**By  
Mohan Raj Kafle**



**Submitted to  
Oriental Bird Club (OBC)  
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Mohan Raj Kafle

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# Chapter 1: Introduction

## Background Information

The **prinias** are small insectivorous birds belonging to the passerine bird family *Cisticolidae*. They are often also alternatively classed in the old world warbler family, *Sylviidae*. These are birds, mainly of open habitats such as long grass or scrub, in which they are not easily seen. They are mainly resident and migration being limited to local cold weather movements. Non-breeding birds may form small flocks. Prinias have short wings but long tapering tails. They are fairly drab birds, brown or grey above (sometimes with dark streaks) and whitish below. Some species have different breeding and non-breeding plumages. The bill is a typical insectivore's, thin and slightly curved.

Among many Prinias, Grey-Crowned Prinia (*Prinia cinerocapilla*) is a globally threatened grassland bird with a very restricted world range (Ali & Ripley, 1987., Birdlife International, 2000). It falls under "Vulnerable" category in IUCN Red List of Threatened Species – 2003 for Nepal. This species is inferred to be rapidly

**Table 1: Status of Grey-crowned Prinia in the World**

Range:	33,000 Km <sup>2</sup>
Population:	>10,000
Altitude:	0-1,350 m
Habitat:	Forest, Grassland
Threat:	Habitat loss and degradation

declining, probably because of destruction and conversion of grasslands throughout its range. It therefore qualifies as Vulnerable.

It is endemic to Indian subcontinent and found only in the Himalayan foothills of Bhutan, India and Nepal (Grimmett et al., 1998., Birdlife International, 2001) where its distribution is almost exclusively restricted to few Protected Areas. The species has a fragmented distribution from Kanchanpur district in the west to Ilam district in the east. It is likely that small and isolated population of this species, which were seen until late 80s might have been extirpated due to factors such as inbreeding, disturbance and habitat deterioration (Baral, 2001). All recent reliable records in Nepal come mainly from two protected areas, Royal Bardia National Park in the west (Cox, 1985., Lama 1991., Wheeldon, 1995) and Royal Chitwan National Park in central Nepal (Gurung, 1983., Inskipp and Inskipp, 1991., Murphey, 1992., Baral and Upadhyaya, 1998). The population of this species in Nepal is thought possibly to be declining (H. S. Baral *in litt.* 1998), in line with an apparent contraction in the extent of suitable habitat (N. B. Peet *in litt.* 2001), although there is no direct evidence to support these opinions.

There is an urgent need for a greater understanding of its status, distribution and ecology especially within Nepal where important populations of Grey-Crowned Prinia are found from Suklaphanta in west to Jhapa and Ilam districts in east (Inskipp and Inskipp, 1991). Further bird surveys in Parsa, northern grasslands and forests in Suklaphanta and Bardia are recommended to establish a better understanding of its status and distribution in Nepal. Any potential grassland in hills should be surveyed for its presence. Further surveys should focus on areas

where there can be a more practical outcome for its conservation and management (Baral, 2001).

This species frequents quite dense forest and secondary growth, particularly around forest clearings and edges from the fringe of the plains up to 1,350 m. It also occurs in shrubby grasslands, especially those close to Sal (*Shorea robusta*) forest, and scrub land. A few records are from more open tall grassland or cultivation in the subtropical, but in general it is "more arboreal" than its congeners.

Its diet includes insects and probably nectar. Although the species is regularly found quite high up in vegetation, it sometimes feeds near the ground as it creeps about in tall grass and low thorny bushes. It is apparently often seen in the company of Grey-breasted Prinia (*Prinia hodgsonii*) when foraging. Virtually nothing is known about the breeding biology of the species (Walters, 1998b). It is thought to breed during the monsoon, mainly in June (Ali and Ripley, 1968\_1998).

## **Objectives of the Study**

### *General Objective*

The general objective of the study is to assess the distribution and habitat preference of Grey Crowned Prinia in Bardia, Kailali and Kanchanpur Districts of Nepal.

### *Specific Objectives*

The specific objectives of the study are as follows:

- To identify the Distribution of Grey Crowned Prinia
- To identify potential habitats of the proposed species in the proposed sites
- To identify the habitat preference of the proposed species
- To identify the threats to the proposed species
- To provide management recommendations for future course of actions

### **Limitations of the study**

Fund is sufficient to carryout the research but the insurgency limits the collection of data outside the protected area. The researcher was not able to use GPS and video camera for data collection due to national security crisis. RBNP is the prime habitat of Royal Bengal Tiger and other wild dangerous species. So identification of this small and unrest species was very difficult. Moreover, the researcher had to stay few time in foot for the personal safety from wild animals. Lack of previous research on this species limits the literature review during the project.

## Chapter 2: Description of the Study area

### Royal Bardia National Park (RBNP)

The Royal Bardia National Park (RBNP) is located in Bardia and Banke districts in the Bheri Zone of Nepal. It occupies an area of 968 sq. km. between  $80^{\circ} 10' - 80^{\circ} 50' E$  and  $28^{\circ} 15' - 28^{\circ} 40' N$ . The western boundary of the park is the Geruga River which is the eastern branch of the longest perennial river of Nepal, called Karnali. The boundary extends east of Geruga up to the Surkhet-Kohalpur road. In the north, the park boundary runs all along the high crest of Churia. In the south, most of the boundary follows the local limits of cultivation and human settlements.

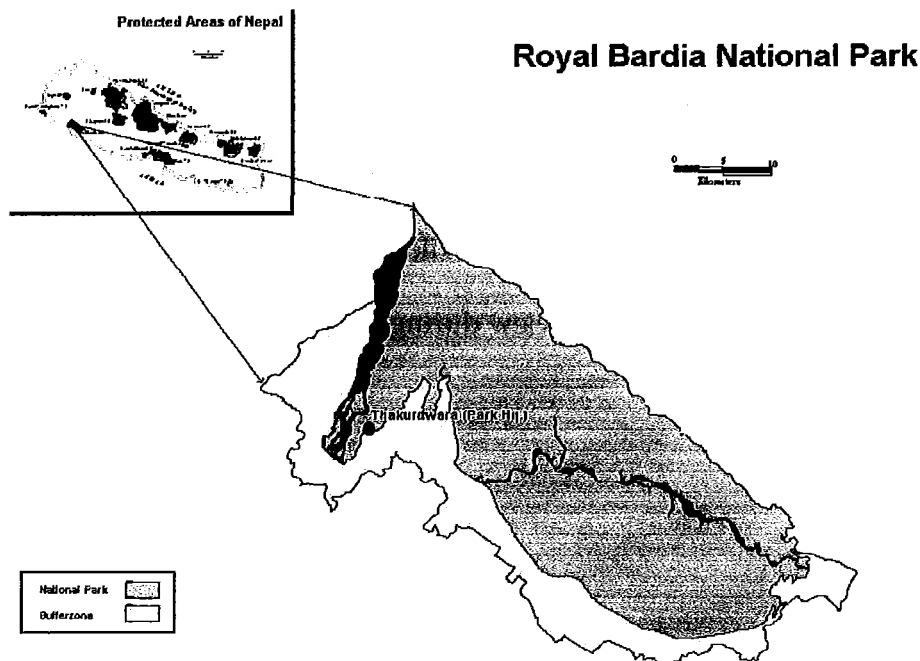


Figure 1: Royal Bardia National Park and its Buffer Zone



RBNP is characterized by forest of *Shorea robusta* as dominant species with a mixture of grassland and riverine forest. Previously disturbed and cultivated sites are dominated by shrubs and scattered trees forming two types of cluster: 1) wooded grassland which is more or less similar to savannah type and 2) open grassland (popularly called "Phanta"). Tussock-forming perennials like *Imperata cylindrica*, *Saccharum spontaneum*, *Erianthus ravennae* and *Vetiveria zizanioides* are some common species of grasses of these derived grasslands. Tall grasses like *Saccharum spontaneum*, *Saccharum benghalensis* and *Phragmites karka* are commonly distributed in the floodplain and along the banks of the Geruwa, Babai and Aurai rivers where the areas are inundated during the monsoon. The park is home to endangered animals such as the Bengal tiger, Wild elephant and Greater one-horned rhinoceros, Swamp deer, Black buck, Bengal florican, Lesser florican, Sarus crane, Grey-crowned Prinia etc. More than 30 different mammals, over 230 species of birds and several species of snakes, lizard and fish have been recorded in the park's forest, grassland and river. In addition to the resident species, several migratory birds visit the park. Riverine forests and grasslands are creating prime habitat for globally threatened birds. The Tharu ethnic group is native to this area.

### **Buffer Zone of RBNP**

The Buffer Zone (BZ) of RBNP spreads on 327 sq. km. area surrounding the park and 11,504 households with 1, 01,000 people inhabit there. It includes 17 Village Development Committees (VDCs). 83 forest user groups are formed in the buffer

zone to conserve and utilize the resources judiciously and rationally on sustainable basis. Grassland covers 0.98 % of total area of BZ. Dominant forest species are *Shorea robusta*, *Acacia catechu* and *Dalbergia sissoo*. Mixed forest covers 21.98% of total area of BZ. The details of buffer zone and land use condition are presented below.

**Table 1: Buffer Zone of RBNP**

Area	327 sq. km.
VDC	17
Villages	147
Ward	94
HH	11504
Forest area	135 sq. km.
CF area	0.51 sq. km.
Residential	192 sq. km.
Population	101000
Male	51733
female	49267
User's committee	83
BZ development committee	1

**Table 2: Land Use of BZ of RBNP**

Sl. No.	Details Of Land-Use	Area Sq. Km.	Percent
1.	Sal forest	36.02	11.02
2.	Khair-sissoo forest	19.70	6.03
3.	Mixed forest	71.86	21.98
4.	Protected forest	33.97	10.39
5.	Agricultural land	135.57	41.48
6.	Grassland	3.20	.98
7.	River/stream	26.68	8.12
	Total	327	100.00

## **Phantas in RBNP**

Mainly there are 5 Phantas of grassland inside RBNP. They are Upper Baghaura, Lower Baghaura, Upper Khauraha, Lower Khauraha and Lamkauli. Upper and Lower Baghaura and Lamkauli are Phanta types, whereas lower and upper Khauraha are classified as wooded grassland. For the purpose of simplicity, the term “Phanta” is used in this study to represent both open and wooded grasslands. This term does not intend to distort the core meaning and importance of wooded grasslands. All these Phantas are in the south west section of the park.

### **Upper and Lower Baghaura**

Upper and Lower Baghaura look like two different pieces of the same Phanta. However local people consider these Phantas as separate entities. The same is the case for Upper and Lower Khauraha. I have also considered these Phantas separately in order to respect the feelings of local people. Upper and Lower Baghaura lie approximately 3.5 km north-west of the BRS at the bank of the Khauraha River. The Khauraha River forms the western boundary of both Phantas. The south and east boundaries of Upper Baghaura is very sharp because of tall trees of *Shorea robusta* and *Terminalia tomentosa*. The two Phantas are separated by a narrow strip of forest Lower Baghaura is open wide grassland with an area of 0.34 km<sup>2</sup> and negligible numbers of trees and shrubs. The south-west sector of Upper Baghaura resembles to some extent wooded grassland of Khauraha because of a

relatively high number of scattered shrubs and trees. Trees in the west portion were cut for temporary royal camping during the visit of the king to the western development region. This may explain the origin of a savannah-like habitat in this section of Upper Baghaura. It covers an area of 0.59 km<sup>2</sup>.

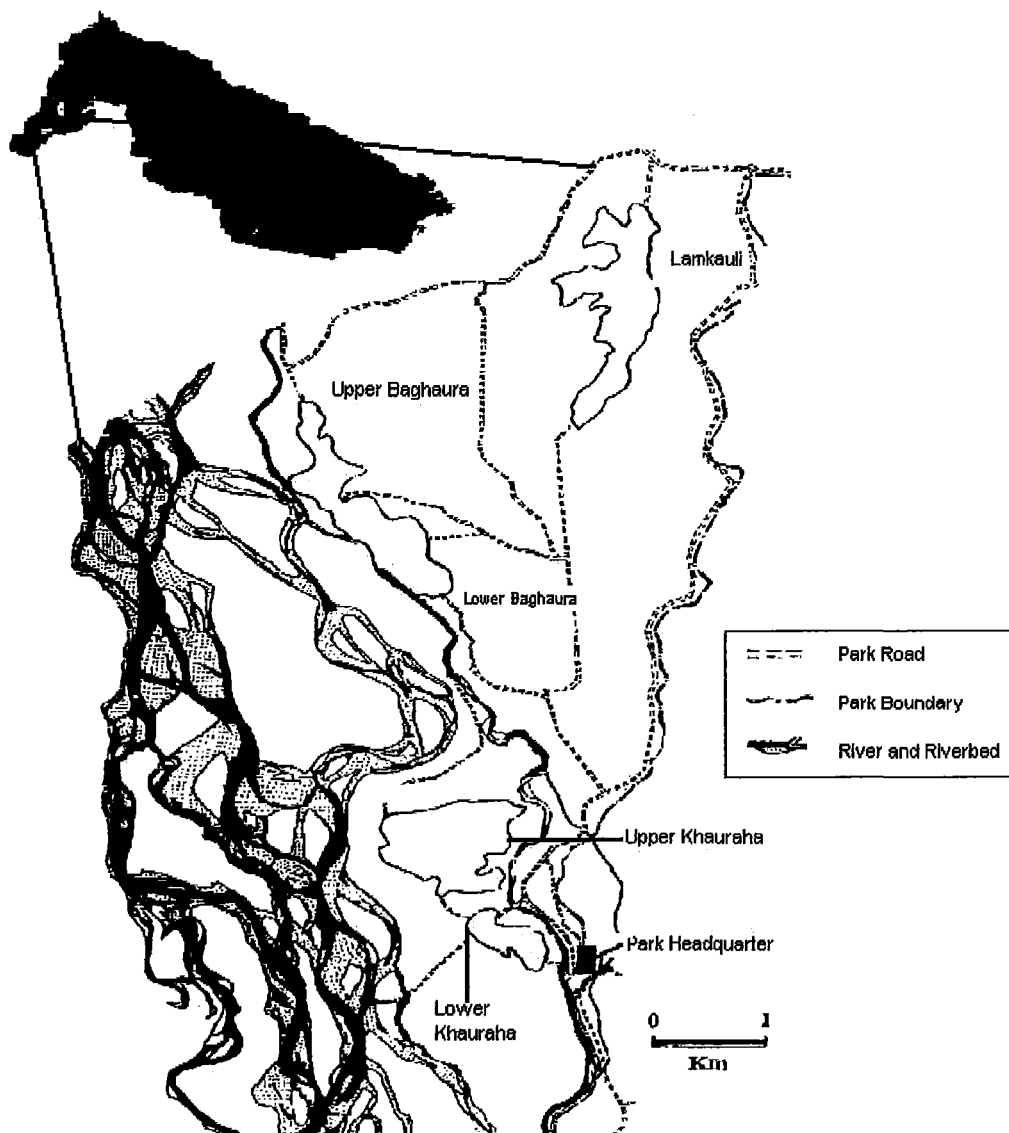


Figure 2: Phantas of Royal Bardia National Park

## **Upper and Lower Khauraha**

Upper and lower Khauraha are located approximately ½ km west of park headquarters and of the Betani Research Station (BRS) across the Khauraha river. These Phantas are separated by a narrow strip of mixed hardwood forest of *Ficus glomerata*, *Mallotus philippinensis* and *Syzigium cumini*. Both Phantas consist of short and tall grasses and a relatively high density of shrubs and trees. Lower Khauraha is smaller (0.34 Sq. Km.) than upper Khauraha (0.95 sq. km.) and is called “Simal Phanta” by local people because Simal trees are the dominant tree component of this Phanta. Similarly upper Khauraha is locally called “Dabdabe Phanta” because a tree species of *Symplocos* dominates in the tree stratum. It was difficult to delineate the study area in these Phantas because of a number of scattered shrubs and trees which do not form any sharp boundary. Hence, boundaries were defined from aerial photographs from 1987 as well as on the basis of field observations.

The Khauraha River is the eastern boundary of both Phantas. Moist riverine and mixed hardwood forest along a branch of the Geruga River form the south and west boundaries of lower and upper Khauraha. The northern boundary of upper Khauraha was delineated on the basis of aerial photographs and field observations as stated earlier.

## **Lamkauli**

Lamkauli is approximately 5 km north of the BRS. It is the longest and biggest (1.11 km<sup>2</sup>) open grassland in the park and is surrounded on all sides by the Sal forest type.

This phanta is drier than the other Phantas and has no regular drainage. There are two ponds in the centre made for retaining water for wild animals.

**Table 3: Description of Phantas within RBNP**

Sl. No.	Phantas	Area (Km <sup>2</sup> )	Characteristics
1.	Lower Baghaura	0.35	<i>Imperata cylindrica</i> , <i>Saccharum spontaneum</i> , <i>Cymbopogon flaxuosus</i> , open wide grassland,
2.	Upper Baghaura	0.59	<i>Imperata cylindrica</i> , <i>Narenga porphyrocoma</i> , <i>Themeda arundinacea</i> , <i>Themeda villosa</i> , <i>Apluda mutica</i> , tall trees of <i>Shorea robusta</i> and <i>Terminalia tomentosa</i> , high number of scattered shrubs and trees,
3.	Lamkauli	1.11	<i>Imperta cylindrica</i> , <i>Vetiveria zizanooides</i> , <i>Cynodon dactylon</i> , longest and biggest open grassland, surrounded by <i>Shorea robusta</i> forest, drier and no regular drainage, two ponds in the centre made artificially for retaining water for wild animals
4.	Lower Khauraha	0.34	<i>Imperta cylindrica</i> , <i>Vetiveria zizanooides</i> , <i>Fimbristylis dichotoma</i> , high density of shrubs and trees, <i>Bombax ceiba</i> dominant,
5.	Upper Khauraha	0.95	<i>Imperata cylindrica</i> , <i>Desmostachya bipinnata</i> , high density of shrubs and trees, <i>Symplicos</i> sp. Dominant

## Chapter 3: Methodology

### Nature and Sources of Data:

Both primary and secondary data were collected from various sources. Primary data was collected from two phantas of the Royal Bardia National Park (RBNP) - *Baghaura and Khauraha Phantas* - and four community forests - *Patharaiya Community Forest (CF), Ganeshpur CF, Aasare Gaundi CF and Guptipur CF* - on the buffer zone of the RBNP. *Patharaiya CF and Ganeshpur CF* are situated in Pashupati VDC and *Aasare Gaundi CF and Guptipur CF* are situated in Manau VDC, both in Bardia District of Nepal. These forests represented the Geduwa Nadi Pariko Khanda (Area Crossing the Geduwa River) and the study has not been carried out on Grey-crowned prinia. So these forests outside the RBNP were selected to study the absence/presence and distribution of Grey-crowned Prinia. Secondary data were collected from the head office of RBNP, libraries and internet through literature survey. Both quantitative and qualitative data were collected. The information on habitat of Grey-crowned prinia and its habitat preference was of quantitative type and information on distribution of the species and threats were of qualitative type. However, the distribution of the species has been located in the map of the study area.

### **Transect and Quadrat Layout**

Transects of different lengths were laid on the Phantas based on their shape. In the lower Khauraha, transects were laid in east west direction but in the upper Khauraha, they were laid in north south direction based on the shape and topographical conditions. Transects in Baghaura were laid in east west direction. Simple random sampling was used to layout the transect lines but it was ascertained that the sample represents the whole phantas. A total of 50 transects were laid in Baghaura Phantas and 70 transects in Khauraha Phantas. The length of transects vary from 50m to 250 m. The transect line was divided into segments of 50m to standardize the survey.

GPS was not used due to the security problem. The vegetation species and common bird species were also recorded. For the analysis of grass species, 136 quadrats of 0.1 m<sup>2</sup> were randomly selected as follows: Upper Baghaura (N=22), Lower Baghaura (N=58), Upper Khauraha (N=28) and Lower Khauraha (N=28), where N = number of quadrats.

### **Direct Observation**

A data sheet was completed in which all bird observations were recorded. The count of species was confined below 10 metres including birds in flight. The birds which were positively identified were only recorded. The census was not conducted in rainy, strongly windy, totally overcast and cloudy days due to probability of incorrect recording of the species. The cover of grasses was visually estimated in the quadrats.



### **Identification of birds**

Prinias are very difficult to identify. However, attempt was made to obtain precise information from the field. Jungle prinia and Grey-crowned prinia look like similar and it takes much time to identify them correctly. Careful observation was done on the size, tail and colour of supercilium of these birds. Prinia was identified by its dim orange colour of supercilium. The tail of jungle prinia was long in comparison to Grey-crowned prinia. Other birds were confirmed through precise observation and guidance from book entitled 'Birds of Nepal' by Helm Publishers Limited.

### **Interviews**

A part from this, interviews with park officials were taken to obtain the key information about the Grey-crowned prinia. Two local persons were hired at different times to assist the data collection.

## Chapter 4: Findings

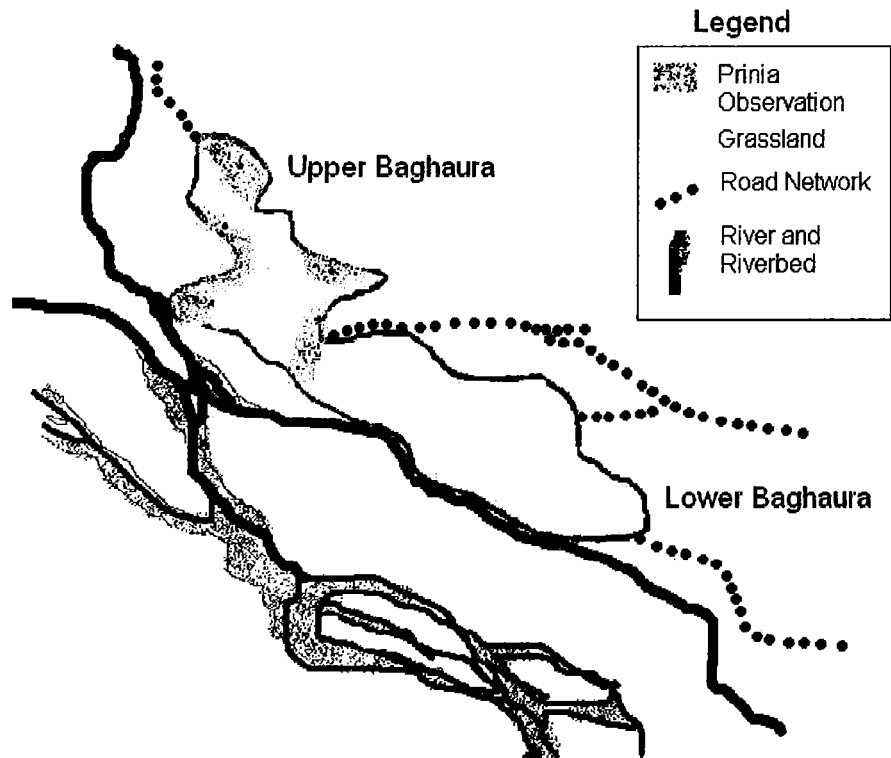
### Distribution of Grey-Crowned Prinia

The distribution of the Grey-crowned Prinia is confined to shrubby grassland of Upper Baghaura and Khauraha (Upper and Lower). The bird was not observed in the Lower Baghaura. Grey crowned Prinia preferred *Themeda* sp., *Narenga* sp., and *Imperata* sp. in the grasslands with high number of scattered shrubs and trees. Other prinias – *Prinia hodgsonii*, *Prinia falviventris*, *Prinia sylvatica*, *Prinia subflava*, *Prinia socialis*, *Prinia criniger* and, *Prinia gracilis* were also observed with Grey Crowned Prinia. Upper Baghaura is the main habitat of Grey-Crowned Prinia. It can be correlated with the abundance of *Themeda* and *Apluda* sp. in Upper Baghaura. The Grass species in each phanta is presented in annex 2.

### Upper Baghaura

A total of 29 Grey Crowned Prinia were recorded in the first survey. In the second survey 21 were recorded. So in Upper Baghaura an average 25 Grey crowned Prinia inhabit. The area of Upper Baghaura is 0.59 km<sup>2</sup>. Therefore, the density of Grey Crowned Prinia in Upper Baghaura is 42.37 per km<sup>2</sup>. This density can not be generalised for other Phantas and areas of park because there is significant variation in habitat factors within the park.

## Distribution of Grey-crowned Prinia in Baghaura Phantas



**Figure 3: Upper and Lower Baghaura of RBNP Showing Distribution of Grey-crowned Prinia**

### **Lower Baghaura**

Grey crowned Prinia was not recorded in Lower Baghaura. However, other Prinia species - *Prinia sylvatica*, *Prinia subflava*, *Prinia socialis* were observed very few in number.

### Lower Khauraha

Grey Crowned Prinia was recorded in this phanta 4 in number. However other prinias were observed more frequent than in lower Baghaura. The area of this phanta is 0.34 km<sup>2</sup>.

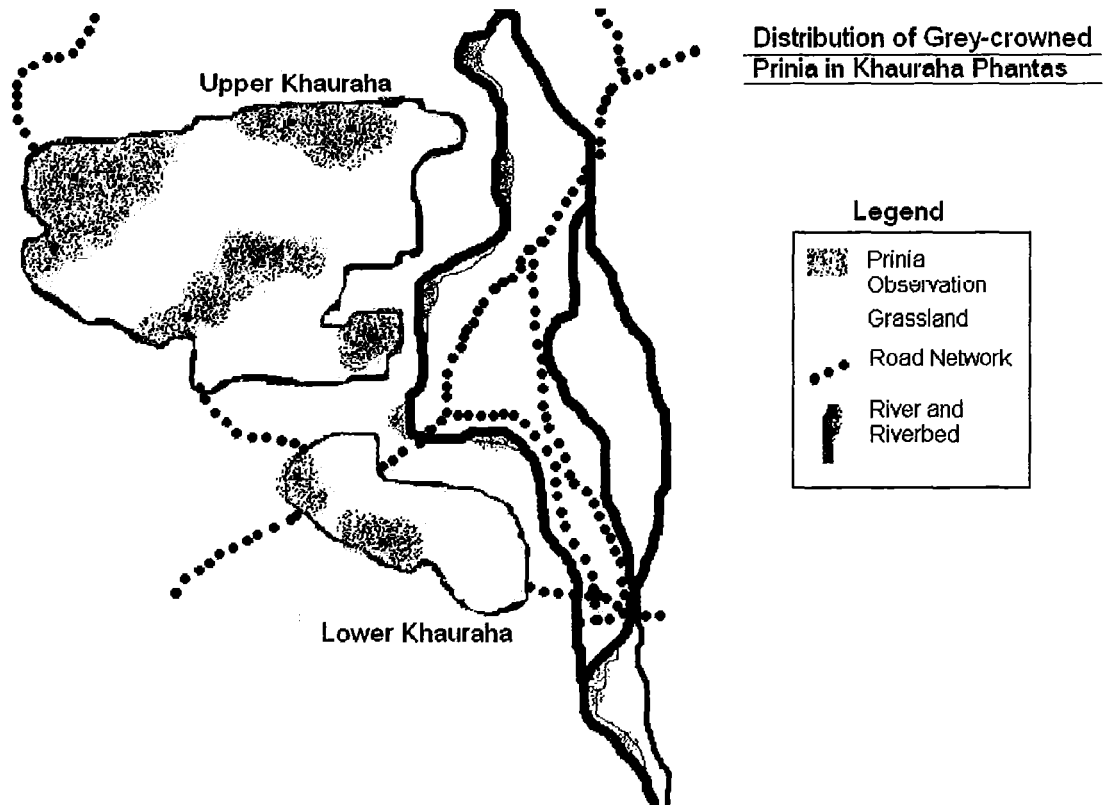


Figure 4: Upper and Lower Khauraha Showing Distribution of Grey-crowned Prinia

### Upper Khauraha

Grey crowned Prinia was recorded in this phanta 6 in number. Other species of prinias were also observed. The area of this phanta is 0.95 km<sup>2</sup>.

### **Patharaiya Community Forest**

This community forest lies in Pashupatinagar Village Development Committee (VDC). It is a part of buffer zone of RBNP known as Geruwa Nadi Pariko Khanda (Area crossing the Geruwa River). Small patches of grasslands with scattered shrubs in the peripheral region of this forest were surveyed to assess the absence/presence of Grey Crowned Prinia outside the park. *Imperata* and *Narenga* species were dominant. A total of 3 Grey Crowned Prinia were recorded in 1000 m transect segments across patches of grassland.

### **Ganeshpur Community Forest**

This community forest lies in Pashupatinagar Village Development Committee (VDC). It is a part of buffer zone of RBNP known as Geruwa Nadi Pariko Khanda (Area crossing the Geruwa River). 6 Grey Crowned Prinias were recorded in total transect of 1250m. This forest is dominated by *Saccharum*, *Imperata* and *Narenga* grass species in the periphery. The record of Grey Crowned Prinia in this zone is an optimistic sign of the existence of this species outside the protected area.

### **Aasare Gaundi Community Forest**

This community forest lies in Manau VDC. It is a part of buffer zone of RBNP known as Geruwa Nadi Pariko Ban (Area crossing the Geruwa River). No Prinia was recorded in this area.

## Guptipur Community Forest

This community forest lies in Manau VDC. It is a part of buffer zone of RBNP known as Geruwa Nadi Pariko Ban (Area crossing the Geruga River). No *Prinia* was recorded in this area.

## Habitat Analysis

Importance Value Index (IVI) of different plant species in the three Phantas is presented below: VE=visual estimation, RD=relative density, FQ=frequency

**Table 4: IVI of Different Grass Species in the Phantas where Grey-crowned *Prinia* Occurs**

Scientific Name	VE	RD	FQ	IVI
<b>Upper Baghaura</b>				
<i>Imperata cylindrica</i>	52.5	68.6	100.0	73.7
<i>Narenga porphyrocoma</i>	17.9	12.1	81.8	37.3
<i>Themeda arundinacea</i>	0.1	0.0	13.6	4.5
<i>Themeda villosa</i>	0.2	0.3	9.1	3.1
<i>Apluda mutica</i>	0.1	0.0	4.5	1.5
<i>Vetiveria zizanioides</i>	5.6	5.3	95.5	35.4
<b>Upper khauraha</b>				
<i>Imperata cylindrica</i>	45.3	62.1	92.9	66.7
<i>Desmostachya bipinnata</i>	3.0	3.5	75.0	27.2
<i>Saccharum bengalensis</i>	14.1	9.0	57.1	26.8
<i>S. spontaneum</i>	7.5	7.1	57.1	23.9
<i>Vetiveria zizanioides</i>	2.1	4.1	60.7	22.3
<i>Narenga porphyrocoma</i>	3.2	1.4	35.7	13.4
<b>Lower Khauraha</b>				
<i>Imperata cylindrica</i>	29.3	36.9	100.0	55.4
<i>Vetiveria zizanioides</i>	5.7	12.3	82.1	33.4
<i>Fimbristylis dichotoma</i>	0.6	4.4	92.9	32.6
<i>Saccharum bengalensis</i>	13.4	16.4	64.3	31.4
<i>Desmostachya bipinnata</i>	5.4	8.4	71.4	28.4
<i>S. spontaneum</i>	4.1	7.9	64.3	25.4

Only few species of grasses were found to dominate the Phantas. The following table presents a list of species with canopy cover above one percent. Among these, *Imperata cylindrica* alone made up a cover of 42.37% on average. No other species were much pronounced since individually they all had a canopy cover below 10 percent. Canopy cover was visually estimated. Graminoid species showing mean percent canopy cover above 1 percent in three Phantas (N = 136) in RBNP

**Table 5: Percent Cover of Grasses**

Species	Percent Cover
<i>Imperata cylindrica</i>	42.37
<i>Saccharum bengalensis</i>	9.16
<i>Narenga porphyrocoma</i>	7.03
<i>Vetiveria zizanioides</i>	4.46
<i>Saccharum spontaneum</i>	3.86
<i>Desmostachya bipinnata</i>	2.8
<i>Themeda</i> species	0.10

### Grassland Types

Grassland types were determined on the basis of IVI of the species.

#### Imperata-Narenga Type (IN)

This type of grassland was found in upper Baghaura in which *Imperata cylindrica* was associated with *Narenga porphyrocoma*, a tall common grass species in the Terai. *Vetiveria zizanioides* was other grass species having IVI above 10. Other associated species was *Themeda arundinaceae* and *Themeda villosa*.

### **Imperata-Desmostachya Type (ID)**

Upper Khauraha had *Imperata cylindrica* in association with *Desmostachya bipinnata*.

Other grasses having IVI more than 10 were *Saccharum bengalensis*, *S. spontaneum*, *Vetiveria zizanioides* and *Narenga Porphyrocoma*.

### **Imperata-Vetiveria Type (IV)**

Lower Khauraha had this characteristic of grassland of *Imperata cylindrica* in association with *Vetiveria zizanioides*. Other grass species in association having IVI above 10 were *Fimbristylis dichotoma*, *Saccharum bengalensis* and *Desmostachya bipinnata*.

### **Habitat Preference of Grey Crowned Prinia**

To identify the habitat preference, the number of observation of the bird species in different vegetation types was recorded and analyzed. The findings are as follows:

**Table 6: Grassland Types Preferred by Grey-crowned Prinia**

<b>Sl. No.</b>	<b>Vegetation Type</b>	<b>No. of Birds Observed</b>	<b>Percentage</b>
1.	<i>Imperata-Narenga</i> type (within park)	25	56.82
2.	<i>Imperata-Narenga</i> type (in Buffer Zone)	9	20.45
3.	<i>Imperata-Vetiveria</i> type	4	9.09
4.	<i>Imperata-Desmostachya</i> type	6	13.64
<b>Total</b>		<b>44</b>	<b>100</b>



56.82% of observed Grey Crowned Prinia prefers habitat dominated by *Themeda-Narenga-Apluda* species with *Shorea robusta* scattered through out grassland. 20.45% of them prefer *Narenga-Imperata* species. 9.09% preferred *Imperata-Fimbristylis* sp. with scattered *Bombax ceiba* trees. 13.64% preferred *Imperata-Desmostachya* species and *Simplicus* sp. The grass species preferred by Grey-Crowned Prinia are *Themeda arundinacea*, *Themeda villosa*, *Apluda mutica*, *Fimbristylis dichotoma*, *Imperata cylindrical*, *Narenga porphyrocoma*, *Symplicus* sp. and *Desmostachya bipinnata*, but the extent of preference varies between these species.

### **Threats**

Significant threats were rarely observed inside the park because of less biotic interference of grassland with scattered trees. But human interference was observed in the grasslands of buffer zone especially in Ganeshpur CF. Inside the park, controlled burning is done in February and March so that no significant damages happen. This leads to development of shrub land structure with new flushes of grasses suitable for Prinias. More grazing, unusual fire incidence and lack of shrubs are the main threats to the Grey-crowned Prinia.

### **Other Bird Species**

Many bird species were observed in the tall grassland habitat with the *Prinia cinerocapilla*, *Cettia flavolivacea*, *Cettia pallidipes*, *Cettia major*, *Cettia brunnifrons*, *Saxicola torquata*, *Saxicola ferrea*, *Saxicola caprata*, *Cisticola exilis*, *Prinia flaviventris*, *Megalurus*

*palustris*, *Timalia pileata* preferred tall moist grasslands. Some of these birds were not observed in the field and taken from Park Management Plan.

The bird species are presented in the following table.

Ashy Prinia	<i>Turdoides nipalensis</i>	<i>Phylloscopus magnirostris</i>	Pied
<i>Prinia socialis</i>	Yellow-breasted	Orange barred leaf	bushchata
Brown hill Prinia	babbler	warbler	<i>Saxicola</i>
<i>Prinia criniger</i>	<i>Macronous gularis</i>	<i>Phylloscopus pulcher</i>	<i>caprata</i>
Fulvous streaked Prinia	Aberrant bush	Paddyfield warbler	White-capped
<i>Prinia gracilis</i>	warbler	<i>Acrocephalus agricola</i>	river chat
Hodgson's Prinia	<i>Cettia flavolivaceus</i>	Plain leaf warbler	<i>Chaimarrornis</i>
<i>Priniahodgsonii</i>	Blandford's bush	<i>Phylloscopus inornatus</i>	<i>leucocephalus</i>
Jungle Prinia	warbler	Rufous capped bush	White-tailed
<i>Prinia sylvatica</i>	<i>Cettia pallidipes</i>	warbler	bush chat
Plain Prinia	Blyth's reed warbler	<i>Cettia brunnifrons</i>	<i>Saxicola</i>
<i>Prinia subflava</i>	<i>Acrocephalus</i>	Slaty bellied ground	<i>leucura</i>
Yellow bellied Prinia	<i>dumetorum</i>	warbler	Golden-
<i>Prinia flaviventris</i>	Brown leaf warbler	<i>Tesia cyaniventer</i>	headed
Abbott's babbler	<i>Phylloscopus collybita</i>	Smoky leaf warbler	cisticola
<i>Turdoides earlei</i>	Chestnut crowned	<i>Phylloscopus fulgiventis</i>	<i>Cisticola exilis</i>
Black-chinned babbler	warbler	Striated marsh warbler	Zitting
<i>Stachyris pyrrhops</i>	<i>Seicercus castaniceps</i>	<i>Megalurus palustris</i>	cisticola
Black-throated babbler	Crowned leaf warbler	Tailor bird	<i>Cisticola</i>
<i>Stachyris nigriceps</i>	<i>Phylloscopus reguloides</i>	<i>Orthotomus sutortius</i>	<i>juncidis</i>
Jungle babbler	Dull green leaf	Tickell's leaf warbler	Baya weaver
<i>Turdoides striatus</i>	warbler	<i>Phylloscopus affinis</i>	<i>Ploceus</i>
Nepal babbler	<i>Phylloscopus</i>	Yellow eyed warbler	<i>philippinus</i>
<i>Alcepe nepalensis</i>	<i>trochiloides</i>	<i>Seicercus burkii</i>	Black
Red-capped babbler	Dusky leaf warbler	Yellow rumped leaf	throated
<i>Timalia pileata</i>	<i>Phylloscopus fuscatus</i>	warbler	weaver
Red-headed babbler	Gray cheeked warbler	<i>Phylloscopus proregulus</i>	<i>Ploceus</i>
<i>Stachyris ruficeps</i>	<i>Seicercus poliogenys</i>	Yellow throated leaf	<i>benghalensis</i>
Rufous-bellied babbler	Gray headed warbler	warbler	Green
<i>Dumetia hyperythra</i>	<i>Seicercus</i>	<i>Phylloscopus cantator</i>	breasted pitta
Slaty-headed scimitar	<i>xanthoschistos</i>	Blue chat	<i>Pitta sordida</i>
babbler	Large bush warbler	<i>Erithacus brunneus</i>	Indian pitta
<i>Pamatorhinus schisticeps</i>	<i>Cettia major</i>	Collared bush chat	<i>Pitta</i>
Spotted babbler	Large billed leaf	<i>Saxicola torquata</i>	<i>brachyuran</i>
<i>Pellorneum ruficeps</i>	warbler	Dark-gray bush chat	
Striated babbler		<i>Saxicola ferrea</i>	

Checklist of birds found in Royal Bardia National Park (RBNP) and adjoining areas is presented in annex 1.

## Chapter 5: Discussion

The distribution of Grey Crowned Prinia depends on the vegetation type and habitat structure. This species was absent in the Lower Baghaura. Lower Baghaura is open wide grassland with grasses *Imperata cylindrica*, *Saccharum spontaneum* and *Cymbopogon flaxuosus*. The absence of trees to some extent and open grassland limited the distribution of this species in Lower Baghaura. The presence of Grey Crowned Prinia in Upper Baghaura, Lower Khauraha and Upper Khauraha is favoured by the presence of undergrowth and scattered shrubs and trees.

Upper Baghaura is the prime habitat of Grey Crowned Prinia. The density of this species is 42.37 per square kilometre. Upper Baghaura is dominated by *Themeda* sp., *Narenga* sp., and *Apluda* sp. with scattered *Shorea robusta* trees. 56.82% of observed Grey Crowned Prinia prefers this type of habitat. Lower Khauraha is dominated by *Imperata-Fimbristylis* sp. with high density of shrubs and trees. *Bombax ceiba* occurs more in this phanta. 9.09% of observed *Prinia cinerocapilla* prefers this type of habitat. Upper Khauraha is dominated by *Imperata* and *Desmostachya* species with high density of trees and shrubs. 13.64% of observed *Prinia cinerocapilla* prefers this type of habitat.

20.45% of observed Prinia prefers *Narenga-Imperata* species outside the park in the buffer zone.

On average, grasses formed a canopy cover of about 81 percent. Among Phantas, the highest cover (94.9%) of grasses was in Lower Baghaura, and the lowest cover (59.5%) in Lower Khauraha. Forbs were insignificant for maintaining canopy cover since the average cover value was far below one percent. On average, the proportion of barren was more than 18%. Lower Khauraha had the highest proportion (40.2%) of barren areas followed by Upper Khauraha (23.1%) and lowest in Lower Baghaura (4.3%).

The total count of Grey Crowned Prinia inside the park is 35 and Outside Park in two community forests is 9. Outside the park, this species is associated with *Narenga-Imperata* species with scattered shrubs and trees.

More frequent grazing and unusual incidence of fire are the main two threats to Grey Crowned Prinia. These factors disturb the wilderness of species. Lack of shrubs is another limiting factor to the occurrence and distribution of this species.

## Chapter 6: Conclusions and Recommendations

### Conclusions

Grey Crowned Prinia prefers *Imperata-Narenga-Themeda* species with scattered shrubs and trees. The occurrence of shrubs favours the occurrence and distribution of this species. Open grasslands such as Lower Baghaura are not true habitat of the Grey Crowned Prinia. Upper Baghaura is the main habitat of the Grey Crowned Prinia.

Grey Crowned Prinia also occurs outside the national park in small patches of grasslands with scattered shrubs. There is great potentiality of saving this threatened species outside the protected area by the proper management of such habitat. The population of Grey Crowned Prinia is 35 inside RBNP and 9 outside the park summing 44 in total.

Regular grazing and unusual incidence of fire are the main threats in the occurrence and distribution of Grey Crowned Prinia outside the Protected Area. Frequent grazing limits the regeneration of grasses. Unusual fire destroys the green vegetation. Absence of tall grasses in natural condition and retention of few shrubs are the main limiting factors to the suitability of the habitat for Grey Crowned Prinia.

## **Recommendations**

Intensive study of distribution of Grey-crowned Prinias in Patharaiya Community Forest

Ganeshpur Community Forest should be conducted soon.

The remaining patches of grasslands in the community forests of buffer zone are very much threatened by human interference such as intensive and regular grazing and fire. People on BZ should be motivated to conserve, at least to maintain, such grasslands for the conservation of this species. So, conservation awareness programs for grassland management for bird conservation should be conducted among the local people and school students so that they feel themselves the importance of birds and their dependency on grasslands and mixed shrubs.

The park management authority gives adequate management efforts to large mammals and birds but small grassland birds have not been given adequate attention. So the priority for the management of the faunal species should be restructured with special conservation provision to Grey-crowned Prinia.

Further research on Absence/Presence Survey of Grey Crowned Prinia through out the Buffer Zone of Royal Bardia National Park (RBNP) should be conducted.

Induced edges with shrubs should be created in Lower Baghaura as far as possible.

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## Annexes

### Annex 1: Checklist of Vegetation Found in Different Phantas of RBNP and Adjoining Areas

LK = Lower Khauraha, LB = Lower Baghaura, UK = Upper Khauraha, UB = Upper Baghaura

Scientific Name	Phantas
<b>A. Dicotyledon</b>	
<i>Acacia catechu</i>	LK
<i>Argustemma verticillatum</i>	LB
<i>Blumea sp.</i>	UB, UK
<i>Bombax ceiba</i>	UB, LB, UK, LK
<i>Callicarpa macrophylla</i>	UK, LK
<i>Carthamus tinctorius</i>	LB
<i>Crotalaria albida</i>	LB
<i>Crotalaria prostrate</i>	LB, UK, LK
<i>Dalbergia sissoo</i>	LB
<i>Desmodium gangeticum</i>	UB, UK, LK
<i>Dillenia pentagyna</i>	LB, LK
<i>Dunbaria sp.</i>	UB
<i>Flemingia macrophylla</i>	LB
<i>Hedyotis ovalifolia</i>	UK, LK
<i>Indigofera linifolia</i>	UB, LB, UK, LK
<i>Knoxia corymbosa</i>	LB
<i>Lagerstroemia parviflora</i>	UB
<i>Leucas mollissima</i>	UK, LK
<i>Maharanga sp.</i>	LB

<i>Mallotus phillippensis</i>	UK, LK
<i>Melia azariach</i>	UK
<i>Mimosa sp.</i>	UB
<i>Murraya koenigii</i>	LK
<i>Ophioglossum nudicaule</i>	UK, LK
<i>Oxalis sp.</i>	UK
<i>Peristylis sp.</i>	LB
<i>Phyllanthus simplex</i>	LB
<i>Phyllanthus sp.</i>	UB
<i>Phyllanthus nurii</i>	LB, UK, LK
<i>Prunella sp.</i>	UK, LK
<i>Scleris biflora</i>	UB
<i>Sporobolus diander</i>	UB
<i>Stellaria media</i>	LK
<i>Shorea robusta</i>	UB
<i>Trifolium repens L.</i>	UB, LB, UK, LK
<i>Euphorbia parviflora</i>	UB, LB, LK
<i>Senecio densiflora</i>	UB
<b>B. Monocotyledons</b>	
<i>Alysicarpus rugosa</i>	UB, LB, UK, LK
<i>Apluda mutica</i>	UB
<i>Arisaena sp.</i>	UB



<i>Byoplytum sensitivum</i>	LK
<i>Bothriochloa ischemum</i>	UB, LB, UK
<i>Coix lachryma-jobi</i>	UB, LB, UK
<i>Cymbopogon flaxuosus</i>	LB
<i>Cynodon dactylon</i>	UB, LB, UK, LK
<i>Cynodon sp.</i>	LK
<i>Cyperus difformis</i>	LK
<i>Cyperus rotundus</i>	UB
<i>Desmostachya bipinnata</i>	UB, LB, UK, LK
<i>Digitaria sp.</i>	LB
<i>Digitaria adsendens</i>	LB, LK
<i>Eragrostis gangetica</i>	LK
<i>Eugenia jambolana</i>	LK
<i>Evolvulus nummularis</i>	LK
<i>Fimbristylis dichotomo</i>	LB, UK, LK
<i>Heliotropium strigossum</i>	LB
<i>Hemigraphis hirta</i>	LK
<i>Imperata cylindrica</i>	UB, LB, UK, LK
<i>Lidernia ciliata</i>	UK, LK
<i>Linium linifolia</i>	LK
<i>Narenga porphyrocoma</i>	UB, LB, UK, LK
<i>Pauzolzia zeylanica</i>	UK
<i>Phragmites karka</i>	UB, LB
<i>Rungia pectinata</i>	UK, LK
<i>Saccharum bengalensis</i>	UK, LK
<i>Saccharum spontaneum</i>	UB, LB, UK, LK
<i>Setaria glauca</i>	LK

<i>Schizachyum brevifolium</i>	LB, UK
<i>Symplicus sp.</i>	UK, LK
<i>Themeda arundinacea</i>	UB
<i>Themeda villosa</i>	UB
<i>Vetiveria zizanoides</i>	UB, LB, UK, LK
<b>C. Pteridophytes</b>	
<i>Diplazium esculentum</i>	UB, LB
<i>Discorea bulbifera</i>	UB
<i>Equisetum debile Roxb.</i>	UB, LB
<i>Selaginella sp.</i>	UK

**Annex 2: Details of Community Forests and User Groups in Buffer Zones of Royal Bardia National Park**

Sl. No.	Name of CFUG	VDC	District	Reg. No.	Population			HH Number
					Male	Female	Total	
1.	Patavar	Patavar	Bardia	13	883	842	1725	184
2.	Desawor Chauni	Patavar	Bardia	12	804	778	1582	202
3.	Bagahipur	Patavar	Bardia	7	458	447	905	102
4.	Raajipur Banghusra Bhairampur	Patavar	Bardia	3	672	744	1116	168
5.	Chulchulighat	Patavar	Bardia	4	481	516	997	111
6.	Bankatti	Patavar	Bardia	14	965	735	1700	105
7.	Janaknagar	Patavar	Bardia	1	713	659	1372	168
8.	Paniphekuwa	Patavar	Bardia	15	699	671	1370	112
9.	Paatalchuli	Gola	Bardia	20	607	600	1207	146
10.	Khallagaun	Gola	Bardia	23	487	535	1022	135
11.	Gidarpur Mainapokhar	Gola	Bardia	17	915	860	1775	201
12.	Geruwa	Gola	Bardia	10	595	562	1157	148
13.	Golagaudi	Gola	Bardia	11	556	644	1200	93
14.	Pasupatinagar	Pasupatinagar	Bardia	8	751	757	1508	200
15.	Sukhad	Pasupatinagar	Bardia	9	561	550	1111	132
16.	Haripur	Pasupatinagar	Bardia	18	240	260	500	107
17.	Patharaiya	Pasupatinagar	Bardia	19	843	886	1729	242
18.	Ganeshpur	Pasupatinagar	Bardia	6	700	975	1675	108
19.	Bindra Banjariya	Pasupatinagar	Bardia	2	607	798	1405	160
20.	Manau	Manau	Bardia	22	992	976	1968	190
21.	Lahorpur	Manau	Bardia	24	361	371	732	118
22.	Guptipur	Manau	Bardia	5	709	592	1300	201
23.	Belbhariya Hattikhalla	Manau	Bardia	21	708	1208	1917	124
24.	Asaregaundi	Manau	Bardia	16	569	857	1426	192
25.	Tanduwa	Suryapatuwa	Bardia	46	286	244	530	81
26.	Kailasi	Suryapatuwa	Bardia	45	579	535	1114	169
27.	Dalla	Suryapatuwa	Bardia	48	125	114	139	30
28.	Bahadurpur	Thakurdwara	Bardia	47	307	313	620	72
29.	Sukhad Sutaiya	Thakurdwara	Bardia	57	463	421	884	152
30.	Bindrapuri	Thakurdwara	Bardia	51	579	554	1133	155
31.	Chitkaiya	Thakurdwara	Bardia	54	426	426	852	114
32.	Betani	Thakurdwara	Bardia	53	311	260	571	88
33.	Banugaun	Thakurdwara	Bardia	50	257	247	504	64
34.	Sivapur Bandrahawa	Thakurdwara	Bardia	49	398	324	722	114
35.	Thakurdwara	Thakurdwara	Bardia	52	435	443	878	134
36.	Madela Gobrela	Thakurdwara	Bardia	55	563	548	1111	94
37.	Bhudkaiya	Thakurdwara	Bardia	56	528	509	1037	106
38.	Mohanpur	Sivapur	Bardia	71	766	760	1526	170
39.	Tulasipur	Sivapur	Bardia	67	300	305	605	60
40.	Bakuwa	Sivapur	Bardia	68	497	503	1000	105

41.	Sundarpur	Sivapur	Bardia	72	576	586	1162	94
	Kaligaudi	Sivapur	Bardia	73	583	532	1115	159
42.	Bhadeli							
43.	Lathuwa	Sivapur	Bardia	65	302	302	604	44
44.	Manikapur	Sivapur	Bardia	69	327	311	638	101
	Tallo	Sivapur	Bardia	70	204	199	403	59
45.	Bankhet							
46.	Mathillo Bankhet	Sivapur	Bardia	66	323	289	612	65
47.	Motipur	Sivapur	Bardia	64	203	209	412	59
	Pratappur	Neulapur	Bardia	76	494	355	849	70
48.	Perhani							
	Balanti	Neulapur	Bardia	75	934	78	1712	130
49.	Amreni							
50.	Neulapur	Neulapur	Bardia	83	786	674	1460	202
51.	Bhurigaun	Neulapur	Bardia	81	811	913	1724	126
52.	Karmala	Neulapur	Bardia	74	613	687	1300	127
53.	Dumreni	Neulapur	Bardia	79	732	1231	1963	109
54.	Simhabahini	Neulapur	Bardia	78	471	559	1030	203
	Ranipur	Neulapur	Bardia	77	610	605	1215	145
55.	Sujanpur							
	Khulpur							
56.	Kanchanpur	Neulapur	Bardia	80	243	245	488	61
57.	Satgharuwa	Neulapur	Bardia		505	975	1480	100
58.	Gargada	Neulapur	Bardia	58	800	1025	1825	101
59.	Manpur	Neulapur	Bardia	60	250	300	550	65
60.	Sainpur	Neulapur	Bardia	61	458	447	905	115
61.	Mirchaiya	Neulapur	Bardia	59	625	659	1284	149
	Bamanpur	Neulapur	Bardia	62	529	501	1030	122
62.	Maynpur							
63.	Dangpur	Baniyapur	Bardia	44	2001	1944	3945	265
64.	Harnawa	Magargadhi	Bardia	42	991	971	1962	268
65.	Siuniya	Magargadhi	Bardia	43	1070	1095	2165	203
66.	Rambhpur	Magargadhi	Bardia	41	1152	1093	2245	300
67.	Aunri	Magargadhi	Bardia	40	1307	1365	2672	416
68.	Katarnia	Dhadhawar	Bardia	38	987	896	1883	174
69.	Dudda	Dhadhawar	Bardia	39	977	1478	2455	124
70.	Khairani	Dhadhawar	Bardia	36	571	566	1137	147
71.	Dhakailaa	Deulakala	Bardia	37	368	319	687	60
72.	Belauli	Deulakala	Bardia	34	870	1355	2225	110
73.	Thumni	Motipur	Bardia	35	341	333	674	121
74.	Asneri	Belawa	Bardia	33	365	360	725	110
75.	Amohiya	Belawa	Bardia	28	335	329	654	108
76.	Betahani	Belawa	Bardia	69	335	489	824	146
77.	Simalkuna	Belawa	Bardia	32	263	369	632	151
	Ranjha	Belawa	Bardia	30	244	251	495	115
78.	Bichtole							
	Dhaireni	Belawa	Bardia	31	397	368	765	129
79.	Jaljala							
80.	Chepang	Belawa	Bardia	25	468	437	905	180
81.	Kurule	Belawa	Bardia	27	377	355	732	130
82.	Chisapani	Chisapani	Bardia	63	1263	1179	2442	222
	Hattikhal	Chinchu	Bardia	26	510	480	990	162
83.	Geruwani							

