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## Owls in a densely populated landscape of Lucknow district within the gangetic plain, India

Daya Shanker Sharma<sup>1</sup>, Ankit Sinha<sup>1</sup>, Shivangi Mishra<sup>1</sup>, Adesh Kumar<sup>1, 2</sup>, Amita Kanaujia<sup>1, 2\*</sup>

<sup>1</sup>Biodiversity and Wildlife Conservation Lab, Department of Zoology, University of Lucknow, India

<sup>2</sup>Institute for Wildlife Sciences, ONGC Center for Advanced Studies, University of Lucknow, India

\*Corresponding author: [kanaujia.amita@gmail.com](mailto:kanaujia.amita@gmail.com)

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### ABSTRACT

This paper intended to establish a list of owls found among a dense human population of Lucknow district with a population density of 1816 persons per square Km. The study was carried out for a year from 2016-17. Spots were located by secondary survey from the general public, usually residents of the areas concerned. Owl habitats have been surveyed throughout the district on foot at night, equipped with powerful flashlights, a DSLR Camera (Canon 70D) and binoculars (Bushnell 10x70x70). Care was taken to photograph each species in the daytime for confirmation of identity. Eight species of owls and owlets were recorded despite the dense human population in this area. In addition, a single record of Oriental scops owl (*Otus sunia*) which has not been reported earlier in this area makes this study more relevant. Although, we looked for it on subsequent visits, we did not manage to locate it again. However, it has been sighted in Dudhwa National Park.

**Key words:** Owls, Owlets, Lucknow, population, human, record.

### INTRODUCTION

Lucknow city is the capital of the northern Indian state of Uttar Pradesh. It is situated in a district of the same name on the Gangetic plain. There are no hills or mountains in the area.

With a population density of 1816 persons per sq. km (Anonymous 1 2007), It is among the most densely populated areas in the world. Despite the population, 11.91% of the district is covered with Moderate Dense Forest (116 sq. Km) and Open Forest (185 sq. Km), which are mostly found in small fragments ( Anonymous 2 2014-15.). The forest type in Lucknow district is mainly tropical dry deciduous, where Sal (*Shorea robusta*) predominates following Teak (*Tectona grandis*),

Silver grey wood (*Termanalia tomentosa*), Bidi leaf tree (*Bauhinia racemosa*) (Das et al., 2011).

Hitherto, there has been no survey of owls of Lucknow district. The current survey intended to discover how many species of owls were still to be found in such a densely populated landscape. Although it was known that Barn Owls (*Tyto alba*. Scopoli, 1769) had historically adjusted to human presence throughout their distribution and are often found in urban areas, it was unclear whether other owls and owlets that were known to live around human habitation such as Spotted Owlet (*Athene brama*, Temminck 1821) and Jungle Owlet (*Glaucidium radiatum*. Tickell 1833) were actually adjusting to the extremely dense human population in India. Eleven species of owls are reported from

the general area of Lucknow and adjoining districts (Grimmett et al. 1998), of which 8 species were recorded in the current survey. None of the species previously believed to occur in Lucknow district are known to have specialized diets or other requirements, although notes on the general choice of habitats suggested that most of them preferred to inhabit forested areas (Grimmett et al. 1998).

## STUDY AREA

### Geographical Setting of Lucknow

Lucknow, the capital of Uttar Pradesh, is situated 123 m above sea level. It is situated between 26.30° & 27.10° North latitude and 80.30° & 81.13° East longitude (Fig.1). It covers an area of 3,244 sq.km. It is surrounded on the eastern side by the district of Barabanki, on the western side by the district of Unnao, on the southern side by Raebareli and on the northern side by Sitapur and Hardoi districts.

### Physiographic setting of Lucknow

River Gomti flows through the city. Some of the tributaries of this river are Kukrail, Loni, Beta etc. Sai river flows from the south of the city and in the east enters district Raebareli. The major towns of Lucknow district are Malihabad, Gosainganj, Mohanlalganj, Bakshi Ka Talaab, Amethi, etc.

### General Climate of Lucknow

Lucknow is a land locked city. The distance from the sea gives Lucknow an extreme continental climate with the prevalence of continental air during major parts of the year. Only during the four months from June to September does the air of oceanic origin penetrate to this region and causes increased humidity, cloudiness and rain. About 75 % of the total rainfall is realized during these four months. The year can be broadly divided into four seasons. The cold season starts from December and extends up to end of February. This is followed by the hot weather season which lasts till about first fortnight of June when monsoon arrives over the region. The monsoon continues till September. The two post monsoon months of October and November constitute a transition season from monsoon to winter conditions. The summers in Lucknow are very hot and winters very cold. The temperature may rise up to about 46° Celsius in summers, though the average temperature is around 38-39° Celsius. There are about 4-6 days of heat wave when the maximum temperature of a day rises to 4-6° Celsius above normal values. Though the winters are not bitterly cold on most of the days, the temperature may fall to 3-4° Celsius for a few days in winters when the cold winds from the Himalayan region makes the winters chilly. The winters are also marked by mist and fog in the mornings. However, the sun is often seen in the afternoons. (Anonymous 3 2012).

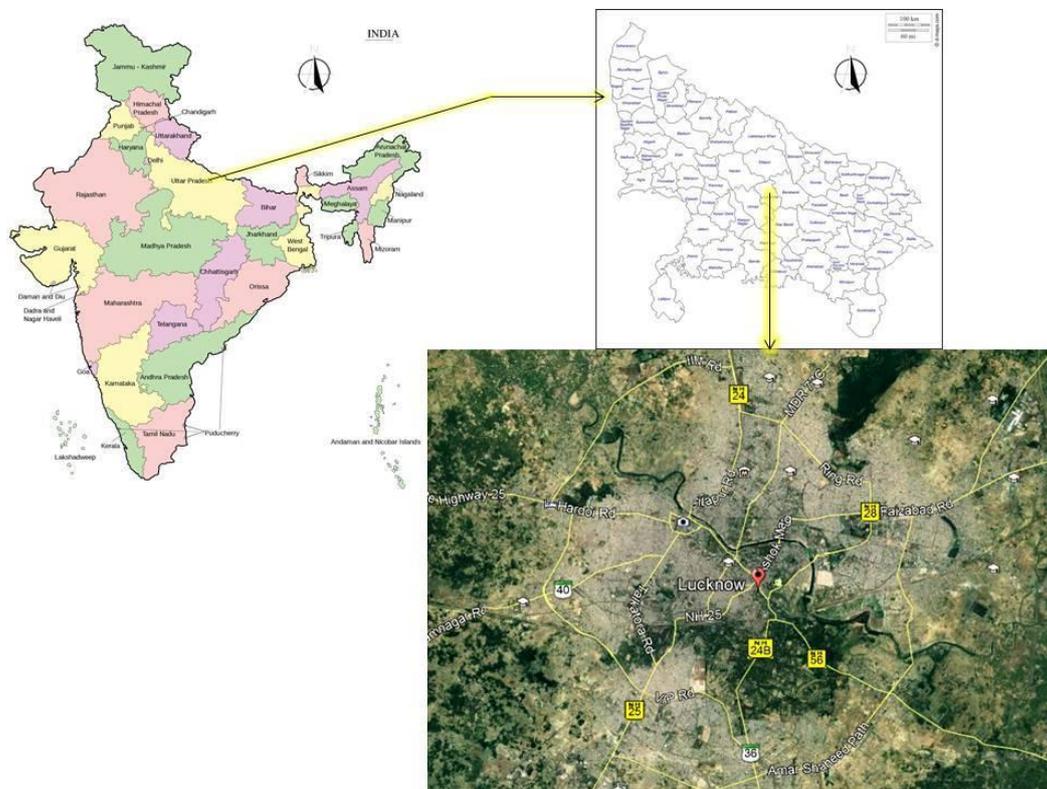


Fig.1: Map of the Study area.

## MATERIAL AND METHODS

Spots were located by secondary survey from the general public, usually residents of the areas concerned. Suspected habitats were located through discussions with Forest Department officials and villagers. Owl habitats have been surveyed throughout the district on foot at night, equipped with powerful flashlights, a DSLR Camera (Canon 70D) and binoculars (Bushnell 10x70x70). Care was taken to photograph each species in the daytime for confirmation of identity. Identification of owls was confirmed using Grimmett *et al.*, (1998).

Eight development blocks of the district were visited opportunistically at all seasons between May, 2016 to April, 2017. Four forest areas, i.e. Kukrail Reserve Forest, Musabagh Reserve Forest, Rehman Kheda forest and the campus of CIMAP were visited. A total of 140 days and nights were spent in the field. Some sites were visited once and others were visited repeatedly, depending upon the presence or absence of owls. Fewer field trips were undertaken during the rainy season. Nesting sites of Barn Owls, Mottled Wood Owls and Spotted Owlets were located.

## RESULTS AND OBSERVATIONS

During the study period, eight species of owls and owlets were found in the study area on the basis of direct encounter. The check list of status and their sighting incidents are listed (Table 1). Out of 11 species reported in the literature (Grimmett *et al.* 1998), eight species of owls have been recorded in this survey (Fig.2A-2H). In addition, a single record of Oriental Scops Owl (*Otus sunia*) in this study area is an addition. Typically forest roosting species like Indian Scops Owl (*Otus bakkamoena*), Jungle Owlet (*Glaucidium radiatum*) and Brown Fish Owl (*Ketopa zeylonensis*) were recorded in forest fragments like PGI Campus (forested area), Musabagh (9 sq. km), Rehman Kheda Forested (1.325 sq. km) area and Kukrail (20.23 sq. km). Barn owls were recorded even in urban areas in Lucknow city. Spotted Owlets (*Athene brama*) and Mottled Wood Owls (*Strix ocellata*) were recorded around human habitation in rural areas.

No road kills of owls were observed throughout the state. More than 5000 square km area have been traversed throughout the state and never observed or heard of a road killed owl. However, few cases have been heard or sometimes seen of owls' injury with barbed wire fences.

Grimmett *et al.* (1998) note that the Eastern Grass owl inhabits tall grasslands. Such habitat could not be found within the district.

**Table 1. Showing Owls and Owlets recorded during study period.**

S.N.	Name of species	Scientific name	IUCN status	Sighting incidents
1.	Barn Owl	<i>Tyto alba.</i> (Scopoli, 1769)	Least concern	Most commonly seen in cavities of dilapidated buildings.
2.	Indian Scops Owl	<i>Otus bakkamoena</i> (Pennant, 1769)	Least concern	Occasionally seen in forested areas near PGI hospital and adjoining areas.
3.	Oriental Scops Owl	<i>Otus sunia</i> (Hudgson, 1836)	Least concern	Once seen during winter in PGI campus.
4.	Indian Eagle Owl	<i>Bubo bengalensis</i> (del Hoyo <i>et al.</i> , 1999)	Least concern	Very commonly seen near Kukrail forest, PGI campus, Rehman Kheda forest
5.	Brown Fish Owl	<i>Ketopa zeylonensis</i> (Gmelin, JF, 1788)	Least concern	Often seen along the river bank near Indira dam, Gau Ghat and Kukrail forest region
6.	Spotted Owlet	<i>Athene brama</i> (Temminck, 1821)	Least concern	Very commonly seen in buildings and isolated forested areas
7.	Jungle Owlets	<i>Glaucidium radiatum</i> (Tickell, 1833)	Least concern	Occasionally seen in forested and adjoining areas around Lucknow
8.	Mottled Wood Owl	<i>Strix ocellata</i> (del Hoyo <i>et al.</i> 1999)	Least concern	Occasionally seen in forested area



**Fig. 2A.** Barn Owl (*Tyto alba*) Photo credit: Ankit Sinha & Daya Shanker Sharma.  
Location: PGI Campus



**Fig. 2D.** Indian Scops owl (*Otus bakkamoena*)  
Photo credit: Prof. Amita Kanaujia.  
Location: CIMAP campus



**Fig. 2B.** Brown fish owl (*Bubo zeylonensis*)  
Photo credit: Megha Chagtoo.  
Location: PGI Campus



**Fig. 2E.** Indian Eagle owl (*Bubo bengalensis*)  
Photo credit: Nelson George.  
Location: PGI campus



**Fig. 2C.** Oriental scops owl (*Otus sunia*)  
Photo credit: Megha Chagtoo.  
Location: PGI campus



**Fig. 2F.** Mottled wood owl (*Strix ocellata*)  
Photo credit: Dr. Nishith Kumar.  
Location: PGI campus



**Fig. 2G.** Jungle owlet (*Glaucidium radiatum*)  
Photo credit: Nelson George.  
Location: PGI campus



**Fig. 2H.** Spotted owlet (*Athene brama*)  
Photo credit: Daya Shanker Sharma.  
Location: Rehman Kheda Forest.

## DISCUSSION

Owls feed mainly on rodents, reptiles and birds, while insects and fish form a smaller part of their regular diet (Anonymous 4). Although dense human habitation would result in the local extinction of most reptiles, birds and small mammal species, it has little effect on the population of rodents, especially rats and mice. Presuming that this is so in Lucknow district, it is not surprising that most owl species are still present in the area, since there is an abundant supply of their food.

Another factor affecting their ability to colonize an area or continue to live in an area would be sufficient, suitable nesting sites and roosting sites. Apparently, dense human habitation does not affect this, either. Since owls are usually not seen, being active at night, they have little to fear from hazards like paper kite strings, which

pose a danger to diurnal raptors and other birds. They are not eaten, except in certain black magic rituals which, luckily, are rarely performed. Overall, they face little persecution from humans. In the US, roadkills form a significant threat to owls (Anonymous 5). Despite considerable wheeled traffic on roads in Lucknow district at all hours of the day and night, owls road kill has not been seen and not even heard of one. This would suggest that owls do not forage along roads, as they do in the US.

Of the owls recorded in this study, five species prefer forests and woodland (Grimmett et al. 1998) while the Barn Owl is known to nest and roost in buildings. The remaining three species are found around habitation and in forests (Inskipp et al. 1991). Of the three species not recorded in the present study, the Eastern Grass owl inhabits tall grasslands (Grimmett et al. 1998). Such habitat could be located in the district, so presumably this owl does not occur within it. The Short-eared Owl inhabits “open country with scattered bushes, grasslands and semi-desert” (Ali et al. 1987). It is a winter migrant and one would have expected it to have been recorded. Perhaps future surveys will find it but one possibility is that, given the paucity of suitable roosting sites in the district and the presence of a spectrum of local owl species, there might be few vacant roosting sites for the species during its winter visits in the district.

Ten species of owls have been recorded in Dudhwa National Park (Rahmani et al. 1998). However, Dudhwa is an undisturbed area while eight species of owls have been recorded in densely populated areas in Lucknow.

Dusky Eagle Owl (*Bubo coromandus*) hides by day in dense foliage and is generally found in Mango groves and forest areas (Grimmett et al. 1998). It is likely that populations of this species exist in the district but we did not manage to locate them during this survey. The call of a Brown Hawk Owl (*Ninox sculata*) also had been heard once during a survey in Rehman Kheda forest but we did not manage to photograph it. So, this species has not been added in our list, since for confirmation, further field surveys have to be undertaken.

Of the species recorded, the five species that prefer forests were recorded at various places in different seasons. The single record of the Oriental Scops Owl (*Otus sunia*) from P.G.I. campus is the first record for the species from the study area. Although, we looked for it on subsequent visits, we did not manage to locate it again. However, it has been sighted in Dudhwa National Park (Rahmani et al. 1998). Sightings of the owls and Owlets in different months of the year at different places are listed (Table 2).

**Table 2. showing sightings of Owls and Owlets during study period.**

Study Areas (Eight Developmental Blocks)	Owls Species							
	Barn Owl	Indian Scops Owl	Oriental Scops owl	Mottled wood Owl	Jungle Owlet	Spotted Owlet	Brown Fish Owl	Indian Eagle Owl
Malihabad (Rehman Kheda)	iii,iv,v,vi	iii.	-	-	iii.	iii,iv,v	-	Vi
Mohan Lal ganj	ix,iii,iv,v	ix,iii.	-	ix,iv,v	ix,iii.	ix,iii,iv	-	iv,v
Bakshi Ka Talab	i,ii,iv,v,x	v	-	-	v	i,ii,iv	-	v,vi
Gosainganj	ix,iii,iv	iv	-	ix,iii	iv	ix,iii,iv	-	-
Kakori	vi,vii	-	-	-	vi,vii	vi,vii	x,ii	Iv
Maal	vi,vii	-	-	-	vi,vii	vi,vii	-	Vi
Chinhat	ix.	-	-	-	ix,	vi,vii	-	-
SarojaniNagar (Musabagh, Kukrail, Kudiaghat, Lucknow University campus, Governor house, CIMAP)	All through the year	i,ii,iii,x,xi	xi	x,xi	i,ii,iii,x,xi	All through the year	x,xi,xii,ii,v	xi,xii,ii,v

\*Roman numerals represent the months of the year

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