

## An Annotated Checklist of Avifauna from Hemchandracharya North Gujarat University Campus, Patan, Gujarat, India

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### Abstract

Birds occupy many levels of trophic webs and play an important role in the ecosystem. Around 1335 species of birds are recorded from India out of which 574 species are recorded from Gujarat. It has been found that educational and defence premises provide a suitable habitat for birds and therefore can be considered as urban biodiversity hotspots. The present study was carried out from September 2018 to February 2020 to estimate the diversity of avifauna of Hemchandracharya North Gujarat University campus. The University is situated in Patan city of north Gujarat which is a semi-arid region. The campus is spread in 212.50 acres area having diverse type indigenous and exotic floral species which attracts a variety of avian species. Total 70 species (13 orders, 38 families and 63 genera) were recorded with maximum diversity recorded from the order Passeriformes and least from Strigiformes. Out of total 70 species, 68 species belong to least concern while *Threskiornis melanocephalus* falls under near threatened and *Neophron percnopterus* under endangered category. The present study is carried out for the first time in the University and will provide a baseline information of the diversity and status of avifauna of the campus for future research perspective and conservation plans.

**Keywords:** Birds, Checklist, Diversity, Hemchandracharya North Gujarat University campus, North Gujarat.

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# 1 Introduction

Birds play an important role in the ecosystem by their huge impact, as predators, scavengers, potential pollinators and also as bio-indicators of the ecosystem. (Amat et al., 2010; Bensizerara et al., 2013). Globally around 10,787 extant species (40 Orders, 252 Families, 2359 Genera) of birds are recorded out of which 1335 species (26 orders, 113 families, and 485 genera) are recorded from India (Praveen et al., 2020c) with Gujarat state having 574 species of birds recorded (Ganpule, 2016). Avifauna is the major component of the ecological food chain and maintains the ecological balance (Singh et al., 2018). However, in present time the avifaunal diversity seems to decrease due to destruction of their natural habitat and human interference by various means like destruction of trees and natural habitats for the commercial use of wood and land (Edison et al., 2016). It has been observed that the majority of biodiversity studies are conducted in the natural and protected areas while urban biodiversity is often neglected (Jules, 1997; Vandermeer, 1997; Singh et al., 2018). It has been identified that although the educational and defence premises occupy less than 5% of the total urban area, they are the hotspot for urban biodiversity (Rajashekara and Venkatesha, 2019).

Patan is a semi-arid region where the temperature ranges from minimum of 8°C to 10°C in winters to maximum 43°C to 47°C in summer and has more agricultural land and very less natural forest area. Such type of geography and diverse climatic conditions are suitable for avifauna. The Hemchandracharya North Gujarat University (HNGU) situated in the centre of the city and provides suitable habitat for avifauna. The University campus has a variety of indigenous and exotic floral species which attracts several species of birds. In the campus, common grass and trees species are *Capparis decidua*, *Abutilon indicum*, *Tribulus terrestris*, *Sesbania cannabina*, *Phyllanthus niruri*, *Euphorbia hirta*, *Achyranthus aspera*, *Celosia argentea*, *Solanum surrattense*, *Cynodon dactylon*, *Azadirachta indica*, *Syzygium cumini*, *Delonix regia*, *Nerium oleander*, *Tecoma stans* etc. which holds variety of animals. Although lots of studies are conducted on the avifauna of Gujarat, the region of north Gujarat is not explored much yet (Parihar et al., 2020a, b; Patel and Dharaiya, 2015). Therefore, the present study was conducted to understand the diversity of birds in HNG University with the aim of providing baseline information by preparing a checklist of avian species for future studies as well as to create awareness for their conservation.

## 2 Materials and Methods

### Study Area

Hemchandracharya North Gujarat University (23°51'50.00"N, 72°08'12.00"E) is located at Patan district of Gujarat state, India (Fig. 1). The approximate area of HNG University campus (HNGUC) covers 212.50 acres. It includes education buildings, sports grounds, gardens, artificial lake, hostels, etc. HNGUC is located on the bank of the Sarasvati River which remains dry in most part of the year except monsoon and post monsoon season. Campus consists diverse type of vegetation due to artificial gardens, botanical garden, and Sarasvati Van (Cultivated mini forest) which contains naturally grown trees, shrubs, grasses, herbs and different varieties of plants species. Majority of the plants are native to place while some are exotic which forms the diverse habitat.

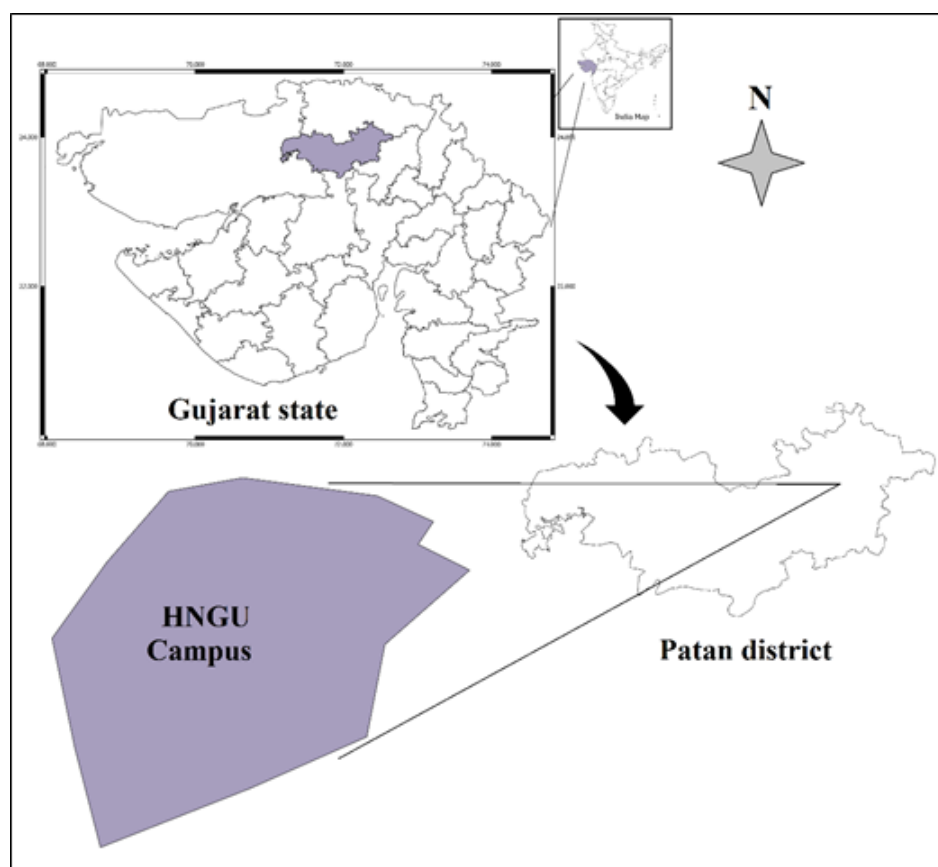


Figure 1. Study Site Map: Hemchandracharya North Gujarat University, Patan District, Gujarat, India.

### Methodology

The survey was conducted for the period of 18 months starting from September 2018 to February 2020 covering all the three seasons (Winter, Summer and Monsoon). The survey includes a total of 108 field visits with an average of 6 visits per month by walking. The survey was conducted in the morning (07:00-10:00 hrs) and evening (16:00 to 17:00 hrs) as birds show maximum activities of foraging and roosting at this time respectively. Sightings were carried out by a visual encounter method and morphological characters were noted down in datasheet. The birds present on trees, sides on trails, roosting on buildings and water bodies were observed using Olympus binocular (10 x 50 DPS 1) and Canon EOS 1300D camera. Birds identification was confirmed using available scientific literature and field guides (Ali, 1966; Ali and Ripley, 1966; Grimmett et al., 2011). The present checklist follows the taxonomy from Praveen et al., (2020a, b). The IUCN category of each species was recorded from the electronic version 2.0 (IUCN, 2020). Birds sighted during the survey were categorized as residents (R), winter visitors (WV) and monsoon visitor (MV). The status of birds in the campus was also reported based on the number of encounters in the field visits as abundant (A, 81-108 visits), frequent (F, 61-80 visits), common (C, 41-60 visits), uncommon (U, 21-40 visits), occasional (O, 5-20 visits) and rare (R, <4 visits), protocol adopted from Vinayak and Mali (2018).

### 3 Results and Discussion

In the present study, total 70 species of birds belonging to 13 orders, 38 families and 63 genera (Table 1) were recorded representing diverse bird community in HNGU campus, Patan, Gujarat. It was observed that majority of species belongs to Passeriformes (19 families, 30 genera, 36 species) followed by Coraciiformes (3 families, 4 genera, 4 species), Charadriiformes (3 families, 3 genera and 3 species), and other families in Figure.2. The previous study conducted by Ganpule (2016) reported 574 species from Gujarat. HNGU campus represents approximately 12.2% diversity of bird found in Gujarat state. Out of all the species reported, a total of 68 species are least concern (LC) and remaining 2 species falls under near threatened (*Threskiornis melanocephalus*) and endangered (*Neophron percnopterus*) category of IUCN. It was also observed that 63 species were resident to the campus while 7 species (*Sarkidiornis melanotos*, *Upupa epops*, *Actitis hypoleucos*, *Anthus campestris*, *Phoenicurus ochruros*, *Culicicapa ceylonensis*, *Pastor roseus*) were winter visitor and 1 species (*Sarkidiornis melanotos*) was monsoon visitor. In case of status of birds in the campus, it was observed that 20 species were abundant followed by 10 species (frequent), 16 species (common), 8 species (uncommon), 9 species (occasional) and 7 species (rare).

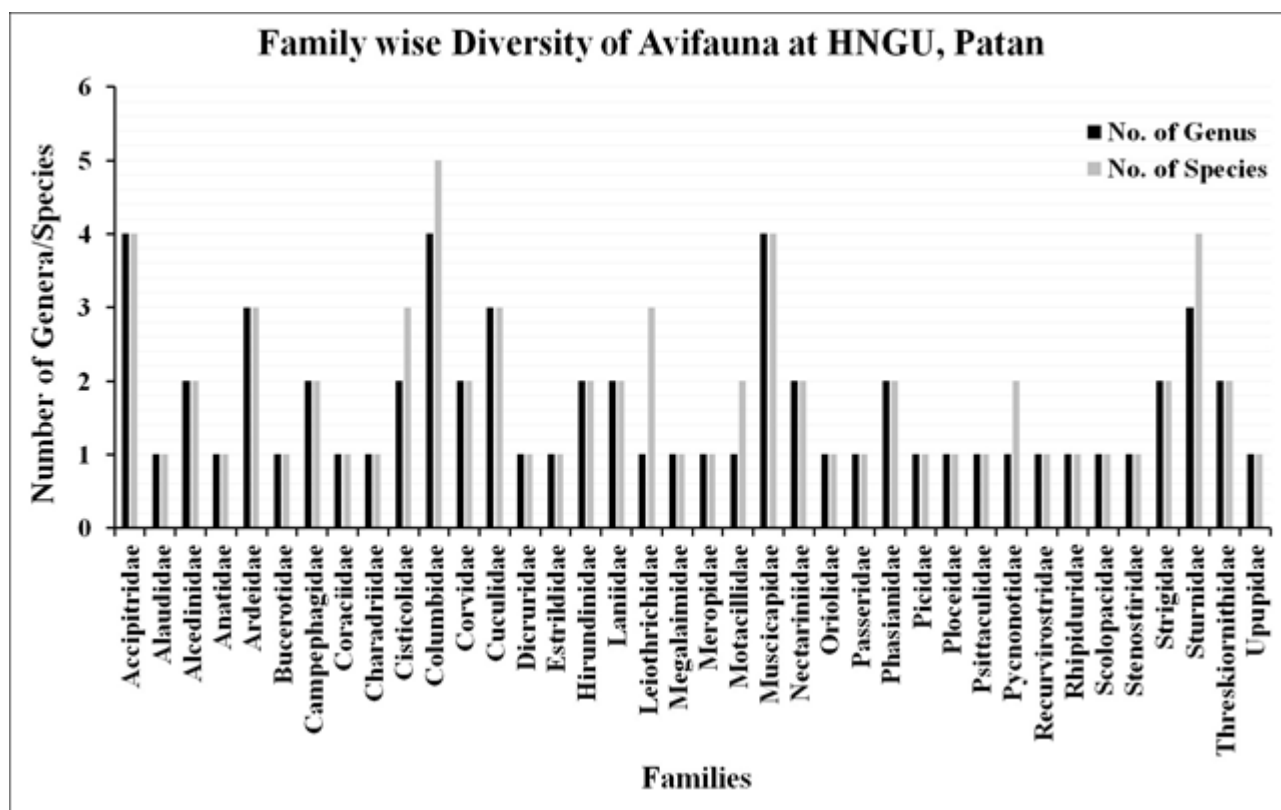


Figure 1. Family wise status of Genera and Species of avifauna found at Hemchandracharya North Gujarat University, Patan, Gujarat.

A similar type of study was conducted in Gujarat University campus, Ahmedabad (260 acres) in which 85 species from 40 families were reported (Jain et al., 2005). Another study conducted at Bangalore University Campus (BUC) (445.15 ha) reported 28 species from 19 families and 26 genera (Rajashékara and Venkatesha, 2017) which is quite less avifaunal diversity as compare to HNGUC. The BUC is having less diversity despite having vast campus area compare to HNGU. The diverse habitat of the HNGU campus holds a large number of avifaunal diversities and it varies

according to the vegetation pattern and human disturbance. HNGU campus protects some old and large trees which are home to many important species such as Indian grey hornbill, Mottled wood owl and Egyptian vultures. Such type of bird diversity in an urban area represents that the campus is having undisturbed habitat. However, unplanned construction and habitat destruction may lead to decline in the rich diversity as birds are known as bioindicators and a minor change in habitat can affect the population of various species (Temple and Wiens, 1989; Sauvjot et al., 1998).

## 4 Conclusion

The present study reports that HNGU campus is quite benign from threat and contains abundant food resources for the birds inhabited here. The study suggests that species of birds occupy different locations in the campus and therefore precautionary measures should be taken for the conservation point of view by acquiring vertical multi-storeyed construction instead of horizontal buildings. Old trees and habitable area must be identified and listed; fruiting and nectar-yielding plants should be afforested along with protecting the small waterbodies. The study also encourages the regular reporting of avifaunal diversity of the campus and surroundings. In North Gujarat region few studies have been carried out and therefore, this study also emphasizes the requirement of diversity studies in this region which is eventually helpful in the conservation.

Table 1. Checklist of Avifauna of Hemchandracharya North Gujarat University, Patan, Gujarat. (Abundant= A; Frequent= F; Common= C; Uncommon= U; Occasional= O; Rare= R; Least concern= LC; Endangered= EN; Near threatened= NT)

Order, Family & Species	English Names	Status	IUCN
<b>Order: Accipitriformes Vieillot, 1816</b>			
<b>Family: Accipitridae Vieillot, 1816</b>			
<i>Accipiter badius</i> (Gmelin, 1788)	Shikra	F	LC
<i>Milvus migrans</i> (Boddaet, 1783)	Black kite	A	LC
<i>Neophron percnopterus</i> (Linnaeus, 1758)	Egyptian vulture	C	EN
<i>Pernis ptilorhynchus</i> (Temminck, 1821)	Oriental Honey-buzzard	U	LC
<b>Order: Anseriformes Wagler, 1831</b>			
<b>Family: Anatidae Leach, 1820</b>			
<i>Sarkidiornis melanotos</i> (Pennant, 1769)	Knob-billed duck	O	LC
<b>Order: Bucerotiformes Furbringer, 1888</b>			
<b>Family: Bucerotidae Rafinesque, 1815</b>			
<i>Ocyrceros birostris</i> (Scopoli, 1786)	Indian grey hornbill	O	LC
<b>Family: Upupidae Leach, 1820</b>			
<i>Upupa epops</i> Linnaeus, 1758	Common hoopoe	C	LC
<b>Order: Charadriiformes Huxley, 1867</b>			
<b>Family: Charadriidae Leach, 1820</b>			
<i>Vanellus indicus</i> (Boddaert, 1783)	Red-wattled lapwing	A	LC
<b>Family: Recurvirostridae Bonaparte, 1854</b>			
<i>Himantopus himantopus</i> (Linnaeus, 1758)	Black-wing stilt	O	LC
<b>Family: Scolopacidae Rafinesque, 1815</b>			
<i>Actitis hypoleucos</i> (Linnaeus, 1758)	Common sandpiper	U	LC
<b>Order: Columbiformes Latham, 1790</b>			
<b>Family: Columbidae Leach, 1820</b>			
<i>Columba livia</i> Gmelin, 1789	Rock pigeon	A	LC
<i>Streptopelia senegalensis</i> (Linnaeus, 1766)	Laughing dove	A	LC
<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Eurasian collared dove	A	LC
<i>Streptopelia tranquebarica</i> (Hermann, 1804)	Red Collared Dove	A	LC
<i>Treron phoenicopterus</i> (Latham, 1790)	Yellow-footed Green Pigeon	R	LC

Order, Family & Species	English Names	Status	IUCN
<b>Order: Coraciiformes Forbes, 1884</b>			
<b>Family: Alcedinidae Rafinesque, 1815</b>			
<i>Alcedo atthis</i> (Linnaeus, 1758)	Common kingfisher	O	LC
<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White-throated Kingfisher	C	LC
<b>Family: Coraciidae Rafinesque, 1815</b>			
<i>Coracias benghalensis</i> (Linnaeus, 1758)	Indian roller	A	LC
<b>Family: Meropidae Rafinesque, 1815</b>			
<i>Merops orientalis</i> Latham, 1801	Green bee-eater	A	LC
<b>Order: Cuculiformes Wagler, 1830</b>			
<b>Family: Cuculidae Leach, 1820</b>			
<i>Centropus sinensis</i> (Stephens, 1815)	Greater coucal	C	LC
<i>Eudynamys scolopaceus</i> (Linnaeus, 1758)	Asian koel	A	LC
<i>Hierococcyx varius</i> (Vahi, 1797)	Common hawk-cuckoo	R	LC
<b>Order: Galliformes Temminck, 1820</b>			
<b>Family: Phasianidae Horsfield, 1821</b>			
<i>Francolinus pondicerianus</i> (Gmelin, 1789)	Grey francolin	C	LC
<i>Pavo cristatus</i> Linnaeus, 1758	Indian Peafowl	A	LC
<b>Order: Passeriformes Linnaeus, 1758</b>			
<b>Family: Alaudidae Vigors, 1825</b>			
<i>Alauda gulgula</i> Franklin, 1831	Oriental skylark	U	LC
<b>Family: Campephagidae Vigors, 1825</b>			
<i>Pericrocotus cinnamomeus</i> (Linnaeus, 1766)	Small minivet	R	LC
<i>Tephrodornis pondicerianus</i> (Gmelin, 1789)	Common woodshrike	C	LC
<b>Family: Cisticolidae Sundevall, 1872</b>			
<i>Orthotomus sutorius</i> (Pennant, 1769)	Common tailorbird	F	LC
<i>Prinia inornata</i> (Sykes, 1832)	Plain prinia	C	LC
<i>Prinia socialis</i> (Sykes, 1832)	Ashy prinia	U	LC
<b>Family: Corvidae Leach, 1820</b>			
<i>Corvus splendens</i> Vieillot, 1817	House crow	A	LC
<i>Dendrocitta vagabunda</i> (Latham, 1790)	Rufous treepie	F	LC
<b>Family: Dicruridae Vigors, 1825</b>			

Order, Family & Species	English Names	Status	IUCN
<i>Dicrurus macrocercus</i> (Vieillot, 1817)	Black drongo	A	LC
<b>Family:</b> Estrildidae Illiger, 1811			
<i>Euodice malabarica</i> (Linnaeus, 1758)	Indian silverbill	F	LC
<b>Family:</b> Hirundinidae Rafinesque, 1815			
<i>Hirundo smithii</i> Leach, 1818	Wire-tailed swallow	O	LC
<i>Petrochelidon fluvicola</i> Blyth, 1855	Streak-throated swallow	U	LC
<b>Family:</b> Laniidae Rafinesque, 1815			
<i>Coracina macei</i> (Lesson, 1830)	Large Cuckooshrike.	O	LC
<i>Lanius vittatus</i> (Valenciennes, 1826)	Bay-backed shrike	R	LC
<b>Family:</b> Leiothrichidae Swainson, 1832			
<i>Argya striata</i> (Dumont, 1823)	Jungle babbler	A	LC
<i>Argya caudata</i> (Dumont, 1823)	Common babbler	C	LC
<i>Argya malcolmi</i> (Sykes, 1832)	Large grey babbler	A	LC
<b>Family:</b> Motacillidae Horsfield, 1821			
<i>Anthus campestris</i> (Linnaeus, 1758)	Tawny pipit	C	LC
<i>Anthus rufulus</i> (Vieillot, 1818)	Paddyfield pipit	C	LC
<b>Family:</b> Muscicapidae Fleming, 1822			
<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental magpie-robin	F	LC
<i>Cyornis tickelliae</i> Blyth, 1843	Tickell's blue flycatcher	R	LC
<i>Phoenicurus ochruros</i> (Gmelin, 1774)	Black redstart	O	LC
<i>Copsychus fulicatus</i> (Linnaeus, 1766)	Indian robin	F	LC
<b>Family:</b> Nectariniidae Vigors, 1825			
<i>Cinnyris asiaticus</i> Latham, 1790	Purple sunbird	A	LC
<i>Leptocoma zeylonica</i> (Linnaeus, 1766)	Purple-rumped sunbird	U	LC
<b>Family:</b> Oriolidae Vigors, 1825			
<i>Oriolus kundoo</i> Sykes, 1832	Indian golden oriole	O	LC
<b>Family:</b> Passeridae Rafinesque, 1815			
<i>Passer domesticus</i> (Linnaeus, 1758)	House sparrow	C	LC
<b>Family:</b> Ploceidae Sundevall, 1836			
<i>Ploceus philippinus</i> (Linnaeus, 1766)	Baya weaver	U	LC
<b>Family:</b> Pycnonotidae Gray, 1840			
<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red-vented bulbul	A	LC



Order, Family & Species	English Names	Status	IUCN
<i>Pycnonotus leucotis</i> (Gould, 1836)	White-eared bulbul	C	LC
<b>Family:</b> Rhipiduridae Sundevall, 1872			
<i>Rhipidura aureola</i> Lesson, 1830	White-browed Fantail	U	LC
<b>Family:</b> Stenostiridae Beresford, Barker, Ryan & Crowe, 2005			
<i>Culicicapa ceylonensis</i> (Swainson, 1820)	Grey-headed canary-flycatcher	R	LC
<b>Family:</b> Sturnidae Rafinesque, 1815			
<i>Acridotheres ginginianus</i> (Latham, 1790)	Bank myna	C	LC
<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common myna	A	LC
<i>Pastor roseus</i> (Linnaeus, 1758)	Rosy starling	C	LC
<i>Sturnia pagodarum</i> (Gmelin, 1789)	Brahminy starling	C	LC
<b>Order: Pelecaniformes Sharpe, 1891</b>			
<b>Family:</b> Ardeidae Leach, 1820			
<i>Ardeola grayii</i> (Sykes, 1832)	Indian pond heron	F	LC
<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle egret	A	LC
<i>Egretta garzetta</i> (Linnaeus, 1766)	Little egret	O	LC
<b>Family:</b> Threskiornithidae Richmond, 1917			
<i>Pseudibis papillosa</i> (Temminck, 1824)	Red-naped ibis	A	LC
<i>Threskiornis melanocephalus</i> (Latham, 1790)	Black-headed ibis	F	NT
<b>Order: Piciformes Meyer &amp; Wolf, 1810</b>			
<b>Family:</b> Megalaimidae Blyth, 1852			
<i>Psilopogon haemacephalus</i> (Statius Muller, 1776)	Coppersmith Barbet	C	LC
<b>Family:</b> Picidae Leach, 1820			
<i>Dinopium benghalense</i> (Linnaeus, 1758)	Black-rumped flameback	F	LC
<b>Order: Psittaciformes Wagler, 1830</b>			
<b>Family:</b> Psittaculidae Vigors, 1825			
<i>Psittacula krameri</i> (Scopoli, 1769)	Rose-ringed parakeet	A	LC
<b>Order: Strigiformes Wagler, 1830</b>			
<b>Family:</b> Strigidae Leach, 1820			

Order, Family & Species	English Names	Status	IUCN
<i>Athene brama</i> (Temminck, 1821)	Spotted owlet	F	LC
<i>Strix ocellata</i> (Lesson, 1839)	Mottled wood owl	R	LC

## Conflict of interests

There are no conflicts of interest.

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## References

- Ali, S., & Ripley, S.D. (1996). A Pictorial Guide to the Birds of the Indian Subcontinent. Bombay Natural History Society and Oxford University Press, Mumbai, 1–183.
- Ali, S. (1996). The book of Indian birds. Oxford University Press, Delhi, 140 pp.
- Amat, J.A., & Green, A.J. (2010). Water birds as Bioindicators of Environmental Conditions. Conservation Monitoring in Freshwater Habitats, Springer Netherlands, 45–52.
- Bensizerara, D., Chenchouni, H., Bachir, A.S., & Houhamdi, M. (2013). Ecological status interactions for assessing bird diversity in relation to a heterogeneous landscape structure. Avian Biology Research, 6(1), 67–77.
- Edison, S.D.P., Abragam, D.A., & Vijila, S. (2016). Terrestrial avifauna of St. John's College campus, Tirunelveli District, Tamilnadu, India. International Journal of Advanced Research, 4(1), 390–395.
- Ganpule, P. (2016). The birds of Gujarat: Status and distribution. Flamingo, 8(3), 2–40.
- Grimmett, R., Inskipp, C., & Inskipp, T. (2011). Birds of the Indian Subcontinent. 2nd ed. London: Oxford University Press & Christopher Helm, 1–528 pp.
- IUCN (2020). The IUCN Red List of Threatened Species. Version 2020–2. Accessed 11 August 2020. Available: <https://www.iucnredlist.org>.
- Jain, N.K., Patel, S.N., & Patel, M. V. (2005). Birds of Gujarat University Campus, Ahmedabad. Zoos' Print Journal, 20(12), 2111–2113.

- Jules, E.S. (1997). Danger in dividing conservation Biology and Agro Ecology. *Conservation Biology*, 11, 1272–1273.
- Parihar, A., Dal, P., Khandla, Y., Parmar, D., Parihar, V., & Parmar, H. (2020). Checklist of avifauna from some selected sites of Visnagar city, Mehsana, North Gujarat. *Journal of Entomology and Zoology Studies*, 8(2), 1232–1243.
- Parihar, A., Dal, P., Khandla, Y., Vala, D., Parmar, D., Parihar, V., & Parmar, H. (2020). Comparative Study on Three Different Avifaunal Community of Mehsana, North Gujara. *Asian Journal of Advances in Research*, 3(1), 21–31.
- Patel, S., & Dharaiya, N. (2016). Inventory of Aquatic Birds with Special Reference to Urban and Desert Wetlands, North-Western Gujarat, India. *Journal of Wetlands Biodiversity*, 6, 29–36.
- Prakash, V., Sivakumar, S., & Verghese, J. (2001). Avifauna as Indicators of Habitat Quality in Buxa Tiger Reserve. Quarterly Report IV, Bombay Natural History Society, Mumbai.
- Praveen J., Jayapal, R., & Pittie, A. (2020c). Taxonomic updates to the checklists of birds of India, and the South Asian region–2020. *Indian BIRDS*, 16 (1), 12–19.
- Praveen J., Jayapal, R., & Pittie, A. (2020b). Checklist of the birds of South Asia (v6.1). Accessed 11 August 2020. Available: <http://www.indianbirds.in/south-asia/>.
- Praveen J., Jayapal, R., & Pittie, A. (2020a). Checklist of the birds of India (v4.1). Accessed 11 August 2020. Available: <http://www.indianbirds.in/south-asia/>.
- Rajashekara, S., & Venkatesha, M.G. (2019). Additions to the Birds of Bangalore University Campus (BUC), India. In *Proceedings of the Zoological Society, Springer India*, 72(2), 197–201.
- Sauvajot, R.M., Buechner, M., Kamradt, D.A., & Schonewald, C.M. (1998). Patterns of human disturbance and response by small mammals and birds in chaparral near urban development. *Urban Ecosystems*, 2(4), 279–297.
- Singh, K., Maheshwari, A., & Dwivedi, S.V. (2018). Studies on avian diversity of Banda university of agriculture and technology campus, Banda, Uttar Pradesh, India. *International Journal of Avian & Wildlife Biology*, 3(2), 177–180.
- Temple, S.A., & Wiens, J.A. (1989). Bird populations and environmental changes: can birds be bio-indicators. *American Birds*, 43(2), 260–270.
- Vandermeer, J. (1997). Avifauna of Agro-Ecosystem of maidan area of Karnataka. *Zoos' Print Journal*, 21(4), 2217–2219.
- Vinayak, D.C., & Mali, S.V. (2018). A checklist of bird communities In Tamhini Wildlife Sanctuary, the northern Western Ghats, Maharashtra, India. *Journal of Threatened Taxa*, 10(3), 11399–11409.