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Cover: Mixed media with fine liners, colour pencils, and watercolour background of an Indian funnel web spider. © Elakshi Mahika Molur.

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SHORT COMMUNICATION

Winter population of raptor species in the Vellalore dump yard of Coimbatore City, India

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Abstract: A study from December 2020 to March 2021 in the Vellalore dump yard, Coimbatore City in southern India recorded 34 bird species, including seven raptors. Notably, two vulnerable species of winter migrant raptors, the Greater Spotted Eagle *Aquila clanga,* and the Tawny Eagle *Aquila rapax* were the most frequently observed. The presence of cow carcasses, poultry, and fish waste in the dump yard attracted scavenger birds, particularly raptors. The study utilized the systematic vantage point method to gather data and aims to establish a baseline understanding of the winter raptor population and other bird species in the garbage dump yard. This research serves as a foundation for long-term monitoring and conservation efforts.

Keywords: Abundance, Accipitriformes, city wastes, congregations, conservation raptors, habitat, migratory, scavenger, southern India, threats.

Birds of prey commonly known as "raptors" include kites, hawks, buzzards, falcons, eagles, harriers, and vultures in the order Accipitriformes and family Accipitridae consisting of a total number of 293–313 species worldwide (Naoroji 2006). Of the 63 species of raptors recorded in India, 59 are believed to migrate in at least part of their range (Ripley 1982; Ali & Ripley 1987; Zalles & Bildstein 2000). Raptor distributions are influenced by factors like the availability of nest sites and food (Thiollay 1989; Anderson 2001); density and reproductive success by prey abundance (Smith & Murphy 1979). Many species of avian groups have recently been shown to be able to colonize and even thrive in urban areas, by attraction to abundant prey supplies usually directly or indirectly promoted by human subsidies (Boal & Dykstra 2018). Dump yards have been shown to provide good feeding habitats to some migratory species of raptors (Garrido & Sarasa 1999; Garrido et al. 2002). The effects of garbage dumps on raptors are of great interest for conservation efforts (Sergio et al 2006) in areas that are or will be developed by humans. Raptors are efficient scavengers therefore their conservation is needed. The objectives of the study were to get baseline information on the winter population of raptors and other birds in the garbage dump yard which would lead to long-term monitoring and its conservation since no earlier study has been undertaken on the avifaunal diversity in the Vellalore dump yard, Coimbatore City.

Materials and Methods

Study Area

The study was conducted in the Vellalore dump yard from December 2020 to March 2021. The dump yard (10.9544^{0}N, 77.0098^{0}E) between Podanur and Chettipalayam is 14 km east of the central part of Coimbatore City (Figure 1). The dump yard area is about 260.21 ha. About 1,300 metric tonnes of garbage waste

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generated daily from households in the city areas are transported and dumped at the Vellalore dump yard (Thyagarajan et al. 2021). The vegetation of the dump yard consists of *Prosopis juliflora*, *Albizia saman, Azadirachta indica*, *Calotropis giganteus,* and *Parthenium* spp. The dump yard is situated on the southern bank of the Noyyal River that irrigates agricultural lands in and around the city facing various threats due to urbanization.

The survey method was followed by point counts at select four vantage points covering the area of the dump yard (Image 1). The points for the survey were chosen in elevated locations with maximum visibility to detect the soaring raptors (Thiollay 1989; Nijman 2004; Eduardo et al. 2007). The study site was visited twice a month and a survey was conducted from 0900 h to 1800 h. The raptors were observed using binoculars (Nikon 15 X 70), and photographs were taken for identification using (Nikon P900), and done with the help of field guides (Ripley 1982; Ali & Ripley 1987; Grimmett 2011). Relative abundance was estimated using the index (percentage) of the total number of individual species divided by the total number of species population, multiplied by one hundred (Woffinden & Murphy 1977)

$$\text{Relative abundance} = \frac{\text{No. of individual of species}}{\text{No. of individual of all species}} \times 100$$

Results

About 34 species of birds including seven species of raptors were recorded during the study from the Vellalore dump yard of Coimbatore City (Tables 1 & 2). The highest occurrence percentages were recorded for four common raptor species throughout the season: Black Kite *Milvus migrans,* Booted Eagle *Hieraaetus pennatus*, Shikra *Accipiter badius*, and Greater Spotted Eagle *Aquila clanga* (Figure 2). While other resident raptor species were observed only sporadically over a few months, all seven raptor species were recorded in March. Black Kites and Booted Eagles particularly congregated abundantly at the dump yard. The winter migrant, the Greater Spotted Eagle, was observed throughout all months, meanwhile, Tawny Eagle *Aquila rapax* was recorded only in March. Tawny Eagle and Greater Spotted Eagle are 'Vulnerable' according to the IUCN Red List (IUCN 2024). Additionally, a total of 27 other bird species, including the passage migrant Rosy Starling *Pastor roseus,* were also recorded

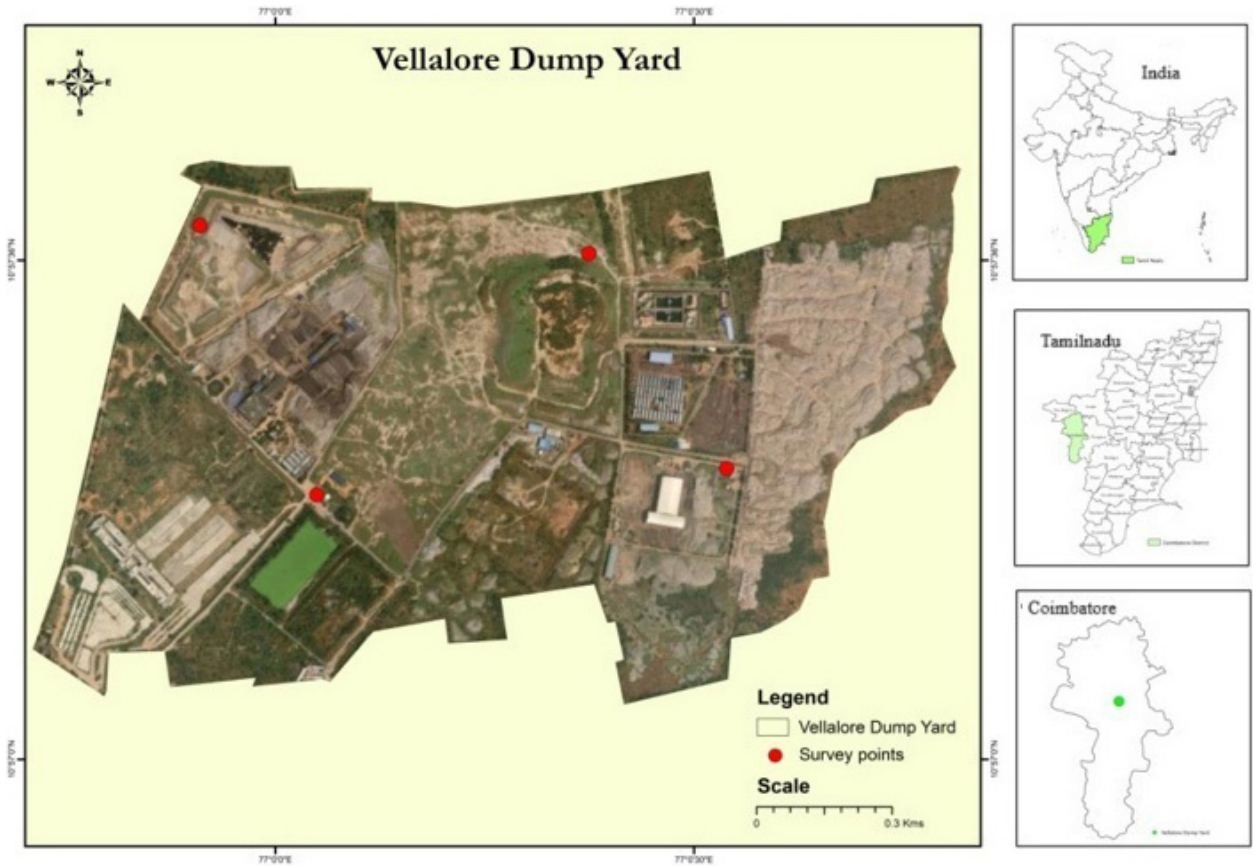

Figure 1. Map showing the study area - Vellalore dump yard.

Table 1. List of diurnal raptors at Vellalore dump yard during the study period.

	Common name	Scientific name	Migratory status	IUCN Red List status/ WPA 2022	RA
Order: Accipitriformes **Family:** Accipitridae	Black Kite	*Milvus migrans*	BR	LC/Sch-II	37.0
	Black-shouldered Kite	*Elanus caeruleus*	BR	LC/Sch-II	3.7
	Brahminy Kite	*Haliastur indus*	BR	LC/Sch-I	0.9
	Shikra	*Accipiter badius*	BR	LC/Sch-I	3.7
	Greater-spotted Eagle	*Aquila clanga*	W	Vu/Sch-I	6.5
	Tawny Eagle	*Aquila rapax*	W	Vu/Sch-I	0.9
	Booted Eagle	*Hieraaetus pennatus*	W	LC/Sch-I	47.2

W—Winter visitor | BR—Breeding Resident | LC—Least Concern | Sch—Schedule | Vu—Vulnerable | RA —Relative abundance | WPA—Wildlife Protection Act.

Table 2. Percentage relative abundance bird species (other than raptors) recorded in the study area (December 2020–March 2021).

	Species name	Scientific name	RA
1	Intermediate Egret	*Ardea intermedia*	31.38
2	Red-wattled Lapwing	*Vanellus indicus*	19.24
3	House Crow	*Corvus splendens*	16.73
4	Black Drongo	*Dicrurus macrocercus*	11.71
5	Red-rumped Swallow	*Cercopis daurica*	6.27
6	Barn Swallow	*Hirundo rustica*	2.51
7	Indian Peafowl	*Pavo cristatus*	2.09
8	Indian Pond Heron	*Ardeo lagrayii*	1.67
9	Ashy Prinia	*Prinia socialis*	1.46
10	Greater Coucal	*Centropus sinensis*	1.04
11	Purple-rumped Sunbird	*Leptocoma zeylonica*	0.83
12	Bay-backed Shrike	*Lanius vittatus*	0.83
13	Common Tailorbird	*Orthotomus sutorius*	0.83
14	Large Grey Babbler	*Turtoides malcolmi*	0.83
15	Pied Bushchat	*Saxicola caprata*	0.41
16	Common Myna	*Acredotheres tristis*	0.41
17	Grey Wagtail	*Motacilia cinerea*	0.41
18	Sykes's Warbler	*Iduna rama*	0.41
19	Plain Prinia	*Prinia inornata*	0.41
20	Purple sunbird	*Cinnyris asiaticus*	0.41
21	Ashy-crowned Sparrow-lark	*Eremopterix griseus*	0.41
22	Asian Koel	*Eudynamys scolopaceus*	0.20
23	Common Kingfisher	*Alcedo atthis*	0.20
24	Rosy Starling	*Pastor roseus*	0.20
25	Rufous Treepie	*Dendrocitta vagabunda*	0.20
26	Asian Palm Swift	*Cypsiurus balasiensis*	0.20
27	Zitting Cisticola	*Cisticola juncidis*	0.20

in the dump yard. Among other common bird species, the Intermediate Egret *Ardea intermedia* showed predominance, followed by the Red-wattled Lapwing *Vanellus indicus*, House Crow *Corvus splendens*, and Black Drongo *Dicrurus macrocercus*, and several others were found with less than 1% occurrence (Table 1). Stray dogs were observed feeding on various organic wastes including poultry in the Vellalore dump yard.

Discussion

This study is the first survey of birds in the Vellalore dump yard, Coimbatore district, and a total of 34 species of birds were recorded. The presence of the winter migratory birds especially raptors such as the Tawny Eagle and Greater Spotted Eagle with the highest relative abundance of Booted Eagle indicated that dumpsites provide sufficient feeding and roosting space for a large number of bird species thereby playing a key role in the conservation of birds (Tesfahunegny & Assefa 2023). The Greater Spotted Eagle record in the dump yard is the 25th site in Tamil Nadu (Santhakumar et al. 2016). Earlier records from the Coimbatore urban area were 135 bird species (Ramakantha et al. 2005), and 321 species (Balaji et al. 2016). The highest relative abundance of few common birds particularly raptor species showed that these birds mostly preferred dump yards for foraging and roosting because the presence of poultry wastes and availability of organic food sources in dumpsites is one of the most important factors influencing the survival and distribution of birds in urban areas (Mehra et al. 2017). Some harmful residues of the toxic substances that are present in the waste may cause bird deaths (Donázar 1993; Newton 1998). Therefore, an urgent need to evaluate the toxicological and health effects of harmful residue exposure of birds especially the globally threatened species for better conservation efforts (Tesfahunegny & Assefa 2023).

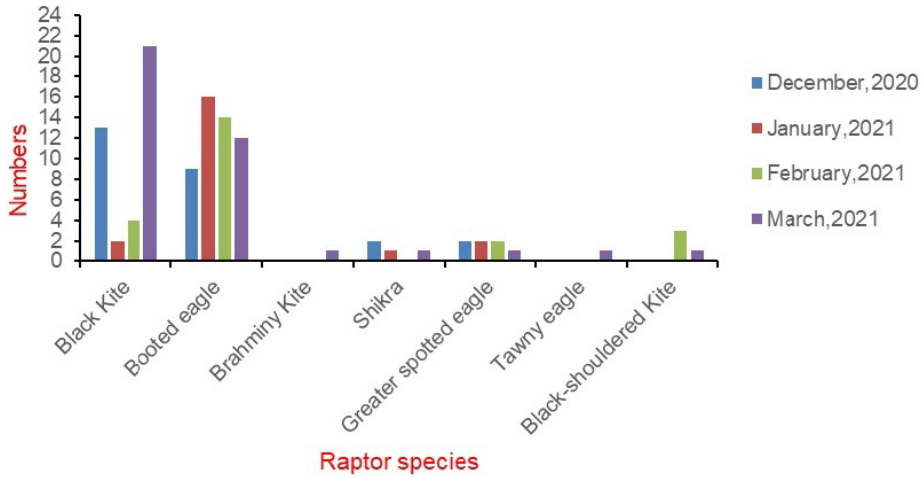

Figure 2. Monthly wise raptor species in the Vellalore dump yard.

Conclusion

This pivotal study on a population of raptors in the Vellalore dump yard offers the baseline data that aids in the long-term monitoring of wintering raptors and paves the way for conservation and preparing management policies as these dump sites also provide constant food for various bird species, particularly migratory raptor species.

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Appendix 1. 1—Booted Eagle | 2—Greater Spotted Eagle | 3—Indian Peafowl | 4—Red-vattled Lapwing | 5—Intermediate Egret.

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