HERONRIES ON A POPULOUS URBAN AGGLOMERATION AND SUBURBS ON THE SOUTHWEST COAST OF INDIA: NESTING SPECIES AND NESTING TREES

PATHISSERY JOHN SARLIN[*], SANCIA MORRIS[**] , SAVIO MORRIS[***], SANDIE MORRIS[****], POLYCARP JOSEPH [*****]

Despite the invaluable ecosystem services provided by the wetlands and the wetland birds, the habitat that is grappling with the reverberations of climate change is increasingly subjected to anthropogenic disturbances worldwide and is deteriorating and decimated incessantly. The present study was conducted in the Indian state of Kerala on the South-western coast of India, during breeding season coinciding with the South-West Monsoon (June–August 2021) to document the existing and previously unknown heronries of the landscape. 22 heronries comprising of five species were documented. The Indian Pond Heron (PH) and Little Egrets (LE) with presence in almost all the sites, dominated the survey neck and neck with 782 (43.5%) and 763 (42.4%) nests respectively. Cormorants were confined to very few sites (5) and built 252 (14.0%) nests and 216 (12.0%) by Little Cormorant (LC) and 36 (2.0%) by Indian Cormorants (IC). Only a single nest (0.06%) of Purple heron was found during the survey, inconspicuously placed in a Reed bed. A total of 28 species of trees and one Reed Bed were utilized by the birds for nesting during the survey period. The results indicate how the colonial nesting water birds are faring in the district and provide a concrete baseline for future conservation and management work.

Keywords: Heronry, nest, nesting species, nesting tree, heron, egret, cormorant.

INTRODUCTION

Ecosystem services provided by wetlands have been relatively well studied and their value has been estimated in an increasing number of cases (MWO, 2012). Water birds too provide invaluable ecosystem services by playing key functional roles in many aquatic ecosystems, including as predators, herbivores and vectors of seeds, invertebrates and nutrients. Waterbirds can maintain the diversity of other organisms, control pests, be effective bio indicators of ecological conditions, and act as sentinels of potential disease outbreaks (Green & Elmberg, 2014).

Waterbirds themselves can be considered as “ecosystems” in that they act as hosts for a wide variety of parasites and commensalists, often specific to a small

number of bird species, including an unknown number of parasite species yet to be described. In some cases, the presence of these parasites makes a major contribution to the total biodiversity in aquatic ecosystems (Green & Elmberg, 2014). These roles have often been overlooked and the attention shifts to the negative ones. "Ecological disservices" (Dunn, 2010), such as transmission of diseases that can potentially affect humans (Hubalek, 2004), or conflicts with fisheries (Carss & Marzano, 2005; Harris *et al*., 2008), are well-known and often wielded as pretext for hostility to wetland birds. However even when all kinds of disservices are taken into account to evaluate the "net contribution" of water birds, the positive ecological consequences of waterbirds outweigh the disservices.

India, home to a myriad of biodiversity rich wetlands spread across all the biogeographic zones is experiencing significant biodiversity depletion and habitat loss. The ruthless plundering of resources of the wetlands exerts immense pressure on the dependent flora and fauna, sparing none including the tree nesting colonial waterbirds, who breed in single or mixed-species colonies (heronries) typically, located in wetlands and associated areas. Having a monitoring programme for heronry birds, which include species of storks, ibises, spoonbills, herons and cormorants, is the need of the hour in India because of its relevance for conservation (Rahmani, 2012). Many of the fish eating heronry birds are apex predators in the aquatic food chains. Therefore, any fluctuation in their principal food source fish (for instance, due to climate change) is likely to be picked up in monitoring exercises, alongside changes in their foraging habitat due to urbanization (Urfi, 2010) or pollution.

In the last century, many heronries across the Indian landscape have been lost (Subramanya, 1996). Disturbance at nesting sites affect nesting behaviour which results in abandonment of the site (Carney & Sydeman, 1999; Roshnath & Sinu, 2017). In Kerala too, some of these changes have impacted colonial nesting water birds, resulting in the loss of heronries (Roshnath & Sashikumar, 2019).

Climate variation may influence bird populations both in their breeding and non-breeding areas, affects breeding success and survival (reviewed in Newton, 1998; Lande *et al*., 2003). Previous studies of herons (e.g., cattle and little egrets, grey heron) (Hafner *et al*., 1992, 2002; Marchant *et al*., 2004; North & Morgan, 1979; Bennetts *et al*., 2000) have emphasized the same. Birds may physiologically respond to changes in temperature and precipitation caused by climate change (Steen & Powell, 2012; Pavón-Jordán *et al*., 2019). Climate change causes major shifts in the features of water bird habitats (Wormworth & Mallon, 2006) and, in conjunction with irregular monsoons, has altered the distribution of their nesting habitats (Urfi, 2011; Jabaraj & Gopi, 2020). Colonial nesting waterbirds breed in a select few locations. Even a small disturbance to those sites may have profound consequences on the waterbird populations. Continued management interventions are required to sustain these dynamic sites for long term conservation (Frank *et al*.,

2021). Thus, information related to nesting locations and breeding periods is vital in long term monitoring of waterbirds in relation to the current climate change (Urfi, 2011).

Kerala has about 15 species of resident and breeding waterbirds nesting in various heronries across the state (Sashikumar *et al*., 2011). Heronry Nest Count, an annual statewide survey of water bird breeding colonies of Kerala coincides with the monsoon (June – August). A survey of nests in water bird breeding colonies in Kollam District was conducted to gain an insight on the current distribution and abundance information on colonial nesting water birds for conserving populations, resolving management conflicts stemming from increasing and expanding populations, and providing the data necessary to manage water bird populations at the local and regional scale. These concerns resulted in a comprehensive survey throughout the district.

The objectives of the survey were to conduct a comprehensive inventory of water bird breeding sites and populations in the district. The specific objectives of the present study were (i) to document and map the existing heronries, (ii) to document the relative abundance of the breeding colonial nesting water bird species and nests across the district, (iii) to understand the nesting tree preferences, nesting heights and document the threats faced by the nesting birds.

Study area

Kollam is a southern district of Kerala bearing Latitude and Longitude 8.99° 00' N 76.87° E respectively (District plan 2018, Kerala State Planning Board), on the South-western coast of India, flanked by the Arabian Sea on the West, Tamil Nadu on the East, Alapuzha and Pathanamthitta districts on the North and Thiruvananthapuram district on the South. The climate of the district is tropical humid with the hot season spreading during the months of March to May, followed by the South-West Monsoon from June to September. After a short spell of dry weather, the North-West Monsoon starts by November and continues through the months of December and January. The average annual rainfall is about 2700 mm and the temperature fluctuates between 22.4°C and 36°C (Nair & George Mathew, 2020). Kollam is home to two of the three Ramsar sites in Kerala-Sasthamkotta Lake, the largest fresh water lake in Kerala and Ashtamudi, a massive, multi-branched water body. Total length of sea coast in the District is about 37 km. Sandy loams are found along the coastal belt, and the forest soil is found in the eastern forest belt. The rest of the district has laterite soil. Major rivers like Pamba, Achancovil, Kallada and Ithikara River endows the district with perennial supply of water. About 70 percent of the work force is engaged in agriculture. The total area of land under cultivation is around 2,18,267 hectares. The major crops grown here are paddy, tapioca, coconut, rubber, pepper, banana, mango and cashew.

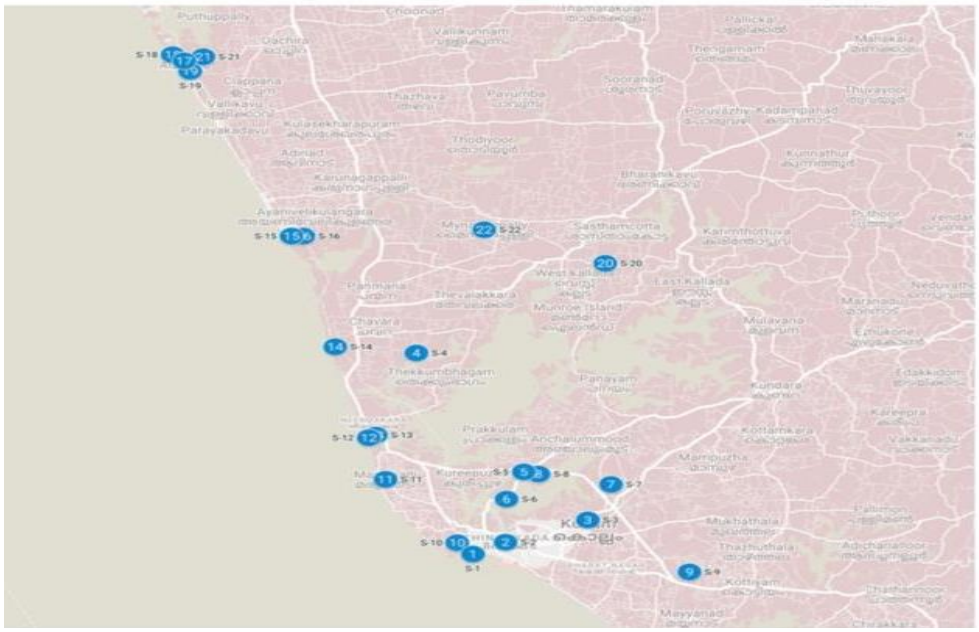

Fig. 1. Map showing location of Heronry of Kollam.

(S1-Vady Harbour; S2-Chinnakada; S3-MG Colony; S4-KOchuveettil Colony; S5-Pallivettuchira; S6-Pernazhikam; S7-Mangad; S8-Thrikadavoor; S9-Saarkarakulam; S10-Kothalavayal; S11-Maruthady; S12-Neendakara Harbour; S13-Neendakara Residential; S14-IRE; S15-Kodi; S16-Kochupalam; S17-Edachira; S18-Kazhukanthuruth; S19-Chanthakadavu; S20-Kakkathoppu; S21-Ayiramthengu; S22-Mynagappally).

MATERIAL AND METHODS

The information about the congregation of water birds was obtained from e-Bird, previous surveys (Roshnath *et al*., 2019) and the citizen responses to our newspaper advertisements for heronry bird sites. Local tree climbers too were approached to gain information about nesting sites, prompted with pictures and photographs from field guides to gather evidence of occurrence. Water bodies were located using Google Earth and its surroundings were surveyed for the presence of breeding colonies of colonial nesting water birds.

The Heronry Survey was conducted during July-August 2021 as part of the Annual Kerala State Heronry Survey that coincides with the South West Monsoon. Trained students (10) in groups of two, with at least three years of bird watching experience volunteered for the survey, as much as possible under the supervision of the District coordinator. All the sites were randomly checked by the District

coordinator to verify the observations. A total of 720 hours spreading three months was spent on active observation by the teams, excluding periodic breaks and travels. The count was taken at the beginning and end of the survey period and arithmetic mean of the same was recorded. Heronries separated at least by 500 m was considered separate entity.

Cold searching (Sutherland *et al*., 2004), i.e., searching visually for nests in all potential nesting habitat in the study area was the method used for finding nests. Only the apparently active or occupied nests and the trees hosting them were counted. Water birds in the breeding colonies were identified, counted, and information pertaining to the GPS location of the heronries, number and details of nesting species and nesting trees were documented.

The proximity of the heronries to water bodies and human habitation was also noted. Though not originally part of the survey, roosting sites were also noted. Standard software was used for quantitative and qualitative analysis of the data. Survey limitations: the eastern forest area was excluded from the survey.

RESULTS AND DISCUSSION

Composition of heronry bird species in the Kollam District

The study was conducted in Kollam district of Kerala state, and covered 22 sites. The study found a total of 1,798 nests on 581 trees of 28 species and a Reef Bed in human-altered habitats. Although 28 tree species were hosting the nests of heronry birds, *Cocos nucifera, Mangifera indica, Azadirachta indica, Casuarina equisetifolia, Artocarpus hirsutus, Tectona grandis,* etc. become the crucial nesting trees of the heronry birds in the urban areas. The abundance of individuals of a tree species correlates strongly with the number of individual birds and species visitation.

22 active nesting sites from Kollam district (Fig. 1) were found during the survey period. Of the five species of colonial nesters observed and recorded during the heronry survey (Table 1), three belonged to Ardeidae family: Little Egret (*Egretta garzetta*), Indian Pond Heron (*Ardeola grayii*), and Purple Heron (*Ardea purpurea*); rest were Phalacrocoracids: Indian Cormorant *Phalacrocorax fuscicollis* and Little Cormorant (*Microcarbo niger*).

581 trees belonging to 28 species and a reed bed hosted 1798 nests of five heronry bird species (Table 1). Highest number of nests was recorded for IPH 782 (43.5%) followed by LE 763 (42.4%), LC 216 (12%), IC 36 (2.0%), and PH 1 (0.06%).

Table 1

Summary of number, height of nesting trees of different species and nest numbers per tree recorded during 2020–2021 in the study area

Nos.	Common Name	Scientific Name	Tree Count	Nest Count					Mean Nest Height (m)
				IPH	LE	LC	GH	IC	
1	Teak	*Tectona grandis*	16	28	132				10.61
2	Badam	*Terminalia catappa*	3	52	5				11.72
3	Coconut	*Cocos nucifera*	353	282	323	34		8	12.32
4	Mahagony	*Swietenia mahagoni*	11	27	6	6		8	10.9
5	Anjili (Wild Jack)	*Artocarpus hirsutus*	19	48	9	21			8.64
6	Acacia	*Acacia crassicarpa*	1	2					7.23
7	Acacia Manjium	*Acacia manjium*	6	2	49	5			6.85
8	Mango	*Mangifera indica*	48	129	16	30			6.63
9	Pride of India (Manimaruth)	*Lagerstroemia speciosa*	1		2				7.28
10	Black Jamun	*Syzygium cumini*	1	1	3				9.32
11	Kattadi /Kite tree	*Casuarina equisetifolia*	24	14	45	24			8.67
12	Malabar Tamarind	*Garcinia cambogia*	1	2					5.83
13	Jackfruit	*Artocarpus heterophyllus*	13	34	3	10			8.12
14	Tamarind	*Tamarindus indica*	7	22	12	35		8	8.41
15	Pulivaka/Ceylon Rose Wood	*Albizia odoratissima*	1	3					6.23
16	White cotton tree	*Ceiba pentandra*	1			2			5.87
17	Peral	Ficus bengalensis	2		4	22		12	6.54
18	NutMeg	*Myristica fragrans*	1	1					5.32
19	Portia Tree (sheelanthy)	*Thepesia populnea*	5	4	21	11			5.21
20	Gooseberry	*Phyllanthus acidus*	3	3					3.82
21	Neem	*Azadirachta indica*	32	56	69				3.52
22	Pala	*Alstomia scholaris*	3		7				7.43
23	Udi	*Lania coromandadica*	3	10	10				6.61
24	Copper pod	*Peltophorum terocarpum*	8	22	23				8.72

Table 1 (continued)

Nos.	Common Name	Scientific Name	Tree Count	Nest Count					Mean Nest Height (m)
				IPH	LE	LC	GH	IC	
25	Subabul	*Leucaena leucocephala*	13	18	9	16			7.91
26	Spanish Cherry	*Mimusops elenji*	1	3					6.23
27	Peepal (Arayal)	*Ficus religiosa*	2	15	4				7.81
28	Nochi	*Vitex negundo L.*	1	4	11				2.86
1	Reed		1				1		1
	Total = (28 +1)		**581**	**782**	**763**	**216**	**1**	**36**	
	Total No of Nests	***1798***							

Cormorants were confined to 5 sites- Kodi, Kochupalam, Kazhukanthuruth, Kakkathoppe and IRE and built 252 (14.0%) nests: 216 (12.0%) by Little cormorant and 36 (2.0%) by Indian Cormorants. These were the sites that had maximum species' nests (4/5). Cormorants nested only when there were nests of LE and IPH. They failed to show in similar large heronries of Vaddy and Neendakara. The water logged area near Muscat Service Station (9.1200, 76.4816) at Ayiramthengu was the only site where a Purple heron nest was found in the reed bed. Interestingly no other heronry bird nests could be located there, making it the smallest nest count and species count of the survey. Single species nests made by Pond herons were found in some sites. Egrets were not seen nesting as single species in any of the sites. Little egret's nests were seen along with the nesting colony of cormorants. All the 22 heronries were seen closely associated with wetland and human habitations (Fig. 2, Fig. 3, Fig. 4).

Composition of nesting tree species in the Kollam District

In Kerala, coconut palm is the most extensively cultivated crop (7,56,890 ha in 2018–2019. It grows virtually everywhere in the state (Kumar & Kunhamu, 2022). In the heronry areas, almost all 3–12m coconut trees were found to host heronry bird nests. LE, IPH, LC and IC preferred mostly coconut trees to other nesting trees. 353 coconut trees were chosen by the 4 species to build a total of 647 nests. Mixed nests of IPH and LE were seen in the same coconut tree on different fronds and inflorescences; cormorants nested separately. Mango trees, the inevitable components of homesteads of the state ranked second among the tree species the heronry birds chose for nesting; 48 mango trees hosted 175 nests. LE built only 16 nests, while IPH made 129 nests in mango trees. Neem, casuarina, jacktree, wildjack, teak were also chosen by the birds in good numbers. A teak tree at Neendakara had the highest nest count of 29, whereas Nutmeg was the tree with the least nest count (1) and tree count (1) (Fig. 5, Fig. 6).

Fig. 2. Left to right: Little Cormorant nest on *Mangifera indica*; Indian Cormorant nest on *Ficus bengalensis*; Little egret nest on *Ceiba pentandra*; Little Egret nest on *Cocos nucifera.*

Fig. 3. Left to right: Little Cormorant nest on *Acacia manjium*; Pond Heron nest on *Mangifera indica*; Pond Heron nest on *Artocarpus hirsutus*; Indian Cormorant nest on *Peltophorum terocarpum.*

Fig. 4. Left to right: Pond Herons nests on *Azadirachta indica*, *Cocos nucifera*, *Tectona grandis* and *Ficus religiosa.*

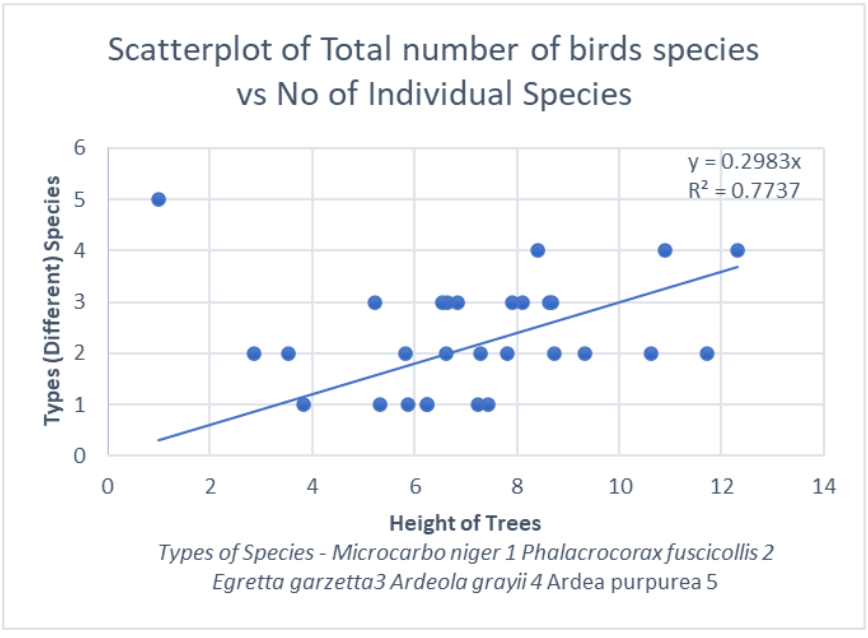

Fig. 5. Correlation analyses for the height of the tree versus the types of individual birds.

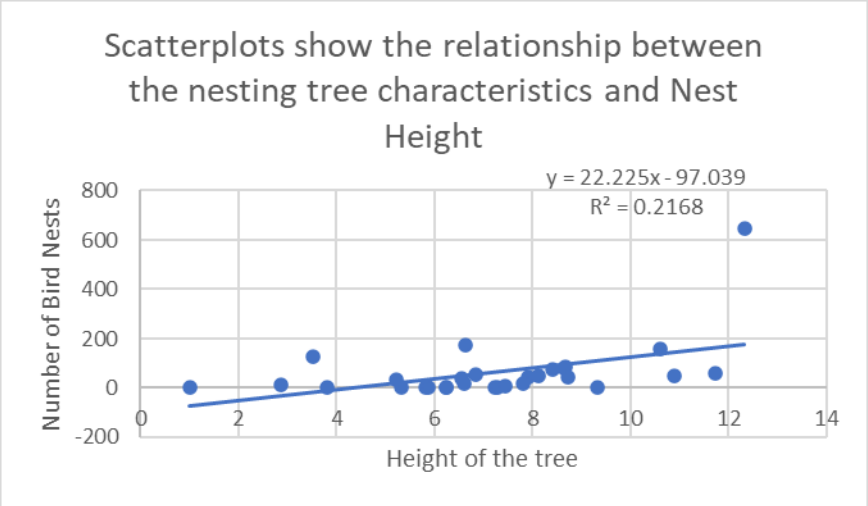

Fig. 6. Correlation analyses for the height of the individual tree versus the number of individual birds' nests.

Proximity of Heronry to Water bodies and human habitation

Three of the major heronries with maximum nesting were located in the premises of busy fishing harbours. All the heronries except the one at Mynagappally were in the midst of human habitations with many of the nests on trees overhanging the houses and busy roads. Majority of nesting trees recorded are coconut trees, which is a cultivated crop and a homestead tree. It was noted that the heronries both big and small were located very near to water bodies at a distance of 5–250 m from water bodies. Closest ones were ponds, paddy fields and lakes while the distant water body was sea.

Kollam, the sothern part of Kerala is inhabited by a wide range of wetland birds. Most of the 15 species that nest or breed in Kerala have been reported from the district too by eBird and avid birdwatchers. Wetland areas in and around the city provides suitable feeding and breeding grounds for these birds, which they use for perching, nesting, foraging and safe haven from predators. The study area being home to two of the three Ramsar sites of Kerala, by itself is offering conducive habitat to the wetland birds. The lakes, rivers, waterways, canals, swamps, mangroves and numerous paddy fields, all, support the heronry birds in one way or the other.

Three major heronries (Vaddy, Neendkara & Kazhukanthuruth) are directly depending on the adjoining fishing harbours for their foraging. Here we have noted that the LE are depredating on the catches of fishing vessels and the landings. In Vaddy and Neendakara harbours, the birds can be seen in large numbers on the truss and roof of the fish handling areas, waiting patiently to scoop up fish from the baskets of head load workers. These birds seem to have lost foraging skills as they

are mostly depredators and scavengers. The heronries are found in crowded residential areas and busy public areas frequented by the general public. In the district that's ranked 48th most populous agglomerations of India (Census of India, 2001), urban and rural demarcation in terms of population density is just namesake.

Areas that are rich in the context of suitable large trees, feeding ground nearby and low predation pressure, probably set the city a preferred breeding ground for the waterbirds (Roshnath & Sinu, 2017). Along with nesting locations, year-round nutrition resources, less predatory pressure and stable climatic conditions offered by an urban ecosystem (Fischer *et al*., 2012; Seedikkoya & Azeez, 2012; Ajitha & Jose, 2015; Griffin *et al*., 2017; Roshnath *et al.*, 2019). Many authors have suggested that a low predatory pressure favours water bird nesting activities in urban areas so, the nest site selection, nesting preference, and architecture of nests directly correlate with the predation rate (Garg, 2016). Results and findings of this survey conforms to the findings of the previous studies with regard to the nesting and proliferation of heronry birds on areas that have suitable large trees, nearby feeding grounds, less predatory pressure, favourable climate. The abundance of the LE nests in the three major heronries can be correlated to the "free meal" the LE effortlessly scoops from the landed fish and discards.

All tree characteristics individually and in interaction with each other predicted the occupancy and the abundance of nests in trees, which is in agreement with the findings of previous studies (Post, 1990; Ranglack *et al*., 1991; Minias & Kaczmarek, 2013). Previous studies suggest that the average height of the nesting trees of heronry birds is 6–11 m (Telfair, 1983; Hilaluddin *et al*., 2006; Sashikumar & Jayarajan, 2007), which might vary with the habitat (Telfair, 1983, 1994; Narayanan, 2014). In the present study the nesting heights recorded are in the range of 2.86-12.32 m. Thorough monitoring of the heronry sites showed that even though other trees with desired characters are present in the vicinity, birds choose to nest in trees that were selected previously (Kelsall & Simpson, 1980; Visser *et al*., 2005). In Nadal, pond-herons nest in small rain tree with less-extent canopy, even though large canopied rain trees were abundant. Street trees are important habitats for birds and other urban taxa (Nagendra & Gopal, 2010). Heronry birds' nests have differential predatory pressure from the birds of prey, snakes, and mouse in the urban and wild natural habitats (King, 1983; Walask, 1990; Gliwicz *et al.*, 1994).

Greater abundance of suitable large trees, low predation pressure, and additional foraging places in the close neighborhood (e.g., fish markets, garbage pile near coast, e.g. Vady and Thangassery harbor) might have set the city a preferred breeding ground for the heronry birds. Though Kollam ranks 4th in the state with 0.530 km^2 mangrove cover constituting 2.71% of Kerala's mangrove forest, we couldn't locate a single nesting in the mangroves even after repeated boat based surveys. The observations indicate their affinity to the urban areas for nesting, over the conventional mangroves and the like. The study finds that the majority of nesting trees are located in wetland areas, nonresidential areas including industrial area, and residential plots (Subramanya, 1996; Sashikumar & Jayarajan, 2007). The affinity of heronry birds to towns and cities was also reported previously in other

parts of India (Subramanya, 1996; Sashikumar & Jayarajan, 2007; Urfi, 2010), and elsewhere (Des Granges & Reed, 1981; Henny *et al*., 1989; Vennesland & Butler, 2004; Vergara *et al.*, 2006). Although heronry birds are highly acclimated to the disturbed environments such as urban areas (Urfi, 2006, 2010; Møller *et al*., 2008), vertical and horizontal expansion of cities, and irresponsible solid waste management are sources of concern for the continued conservation of this important functional group of birds in wetland and urban ecosystems. Notifying the nesting trees as protected sites and proper management of identified nesting trees could help in conservation of these breeding birds.

Heronry at IRE, the government owned processing company, maintained a good population of Little Cormorants and little egrets. The nesting started very recently though it remained a roosting site for several years. Compared to other heronries, human disturbances were very less because of the conservation awareness of company.

Kazhukanthuruth, Kakkathoppe, Edachira & Chanthakadvu regions of Vellanathuruth were found to be a suitable place for breeding as well as roosting. Most of the nesting trees were *Cocos nucifera, Mangifera indica* and *Tamarindus indica*. Indian Pond heron, Little Egret, Indian and Little cormorants breeds here making it a site with conservational priority. Several hundreds of cormorants can be seen on the lakes, especially on the estuary. But nesting birds have been very limited and restricted to faraway sites in the northern end of the district. Thorough search for cormorant nests in the estuarine area, the mangroves and other suitable habitats in rest of the district was futile. Though eBird records of several species of heronry birds are reported from the area, only five species could be found nesting during the survey. Cattle egrets seen at times in hundreds even in breeding plumage during the survey period didn't yield a nest. Storks, grey and reef herons, Oriental darters and Ibises seen in different parts of the district failed to be represented in the nesting survey. 50 or more Oriental darters were seen roosting on a rain tree along with several cormorants and egrets in the middle of the city even during the survey period. Though the site is very old with confirmed roosting of more than 15 years, no nest was found. Search for nests on several mangrove patches of the district was in vain.

CONCLUSIONS

The information compiled here serves as a baseline of recent and available historical distribution and abundance of heronries with details of both nesting species and nesting trees. Wildlife management agencies, conservationists and town planners can benefit from the baseline data as it gives insight into the current colony locations, status and trends of colonial nesting waterbirds and shall be of assistance to them in making decisions about protection through population and land use management. Finally, future surveys and monitoring can be planned using these data as a comprehensive baseline inventory and atlas of these colonies.

The survey results have been provided to Kollam Social Forestry Division, Forest & Wildlife Department of Kerala, the Indian Rare Earths Kollam, the District administration and the State Heronry Group, so that appropriate management strategies can be implemented. Neendkara, Vaddy and Edachira area heronries that are dense waterbird colonies shall be recommended for protection from disturbances through the application of appropriate protective notations or seasonal sanctuaries.

Human bird conflict and other threats

All the heronry sites with nests on trees were in the areas of dense human habitation. Even when the nesting trees were scattered in and around residential areas, the noisy bird, their droppings, falling chicks and the food remnants from the nests caused severe inconveniences to residents and passers-by alike. The obnoxious odour emanating from the accumulated decomposing excreta, dead chicks and leftovers of rotting fish makes life miserable. Vehicles and dresses are soiled by the droppings. Piling up of excreta on trees is blamed for yield and crop loss. Hapless laymen have resorted to retaliatory measures in some heronries by bursting fire crackers, pelting stones, dislodging nests, trimming branches or felling trees outright. Outbreaks of avian flu elsewhere and ecological disservices are used as a pretext to vindicate the hostilities. Thus, general awareness should be given to the local people living there focusing the importance of birds in the ecosystem. A heronry at Neendakara, reported in earlier studies, had very few nests this season as the teak trees were trimmed. Uncontrolled rapid urbanisation, land reclamation, tree felling, ghost nets and gears, poaching are all taking toll on the heronry birds. A concerted effort led by the Forest & Wildlife Department with the active participation of the residents and NGOs is the need of the hour to address the grievances and pave way for the conservation of the heronries. As water birds are considered to be the ecological indicators of wetland ecosystem health, care should be taken to maintain the population of them.

Posters regarding the nesting bird species could be posted under the trees to draw public attention and create awareness. If removing the nesting trees is inevitable for the expansion of the cities, we recommend selective removal of the non-nesting trees in the vicinity first. Local governments may consider erecting heronry guards above the bus waiting shelters if nesting trees are located in such places (Sashikumar C., pers. comm.).

Acknowledgements. Our thanks are due to Mr. V.G. Anil Kumar, the Assistant Conservator of Forests, Kollam Social Forestry Division granted permission and provided logistics support for this research. The Management and HSE Manager Mr. Sanjay of IRE, Chavara, Kollam deserves special gratitude for the permission to survey the heronry, and taking us around. We also thank Heronry Survey Group of Kerala, Kollam Birding Batallion and Mr. Ampadi Sugathan Mynagappally, for their valuable guidance and support.

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Received June 16, 2022

[*]*PG and Research Department of Zoology, Fatima Mata National College (Autonomous), University of Kerala, Kollam, India*
e-mail: sarlinpoly@yahoo.com

[**]*Institute of Chemical Technology Mumbai, IOC Bhuvneshwar Odisha, India*
e-mail: sanciamorris@yahoo.com

[***]*Sainik School, Chhingchhip, Mizoram, India*

[****]*St Antonys High School, Kanjirapally, Kerala, India*

[*****]*Kollam Birding Battallion, Kerala,* India