

A Brief Report
on
Status of Heronries in Some Districts of
Gujarat



**(An outcome of the Citizen Science program of 'Heronry Surveys – 2019' Conducted by
BCSG)**

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Introduction-The Heronry Birds

Heronry also termed as rookery which means an assembly of nests high in a mass of trees which comprises water bird crowds like herons, egrets, storks, ibises, pelicans, spoonbills, darter, and cormorants (Urfi et al 2005, Roshnath and Sinu 2017). The first nationwide heronry survey (based on questionnaire feedback) in India was carried out in the 1990s, during which 26 heronry species were recorded in the country. The first ever state-wide heronry survey (based on actual field observations) was organised by GEER Foundation, Gandhinagar in the early 2000s. As an outcome, Pandey et al. (2010) reported 21 heronry-forming species in the state. These two surveys have indicated that the heronry-forming bird species in India including Gujarat belong to orders *Pelecaniformes* and *Ciconiiformes*. The species belonging to the families *Phalacrocoracidae* and *Anhingidae* of the order *Pelecaniformes* and *Ciconiidae*, *Ardeidae* and *Threskiornithidae* families of the order *Ciconiiformes* are considered as heronry species. Of these, 21 species are found breeding in Gujarat (Table-1). Black-necked Stork (*Ephippiorhynchus asiaticus*), though belongs to the Ciconiidae family, is known to be a solitary nester; therefore, it is not included.

Methodology

The survey was carried out through citizen science and districtwise teams were formed. The teams were facilitated with uniform datasheets and informative materials. The data received from various locations were compiled and analysed for qualitative and quantitative informations.

Summary of Result

Of the 21 heronry species that are known to breed in Gujarat, a total of 18 species (85.7%) were recorded during the current heronry survey in 2019. These species are listed in Table 2. All the 21 species known to breed in the State, except Painted Stork, Glossy Ibis and Oriental Darter, were observed breeding in one or the other districts covered during the survey. The reason for the lack of record of nesting of these species seems to be partial coverage of the state for the heronry survey and / or variations in the observation periods. Thus, Jamnagar district cannot be devoid of nesting of Oriental Darter and Painted Stork, but data from Jamnagar was not received during the survey, and thus it has not been included. Nesting of Painted Stork and Oriental Darter is not uncommon for other districts such as Bhavnagar, Porbandar, Jamnagar, Devbhoomi Dwarka, Kachchh. The Painted stork heronries are reported from districts of central Gujarat such as Anand, Kheda, Vadodara and Ahmedabad also. However, these heronries were not reported during this study. Similarly, Glossy Ibis is also known to breed in certain pockets of the Kachchh district, and also reported to breed in Bhavnagar in the year 2004, but during the surveys, unfortunately Glossy Ibis nests were not recorded. Such limitations were inevitable due to the voluntary nature of the survey.

Table -1: A Checklist of Heronry Birds in Gujarat State

SN	Common Name	Scientific Name	IUCN Red List & IWL Schedule I/II Threat Status
1	Painted Stork	<i>Mycteria leucocephala</i>	NT
2	Asian Openbill	<i>Anastomus oscitans</i>	LC
3	Woolly-necked Stork	<i>Ciconia episcopus</i>	NT
4	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT
5	Red-naped Ibis	<i>Pseudibis papillosa</i>	LC

6	Glossy Ibis	<i>Plegadis falcinellus</i>	LC
7	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC, Sch-I
8	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	LC
9	Indian Pond-Heron	<i>Ardeola grayii</i>	LC
10	Grey Heron	<i>Ardea cinerea</i>	LC
11	Purple Heron	<i>Ardea purpurea</i>	LC
12	Striated Heron	<i>Butorides striata</i>	LC
13	Cattle Egret	<i>Bubulcus Ibis</i>	LC
14	Little Egret	<i>Egrett garzetta</i>	LC
15	Intermediate Egret	<i>Mesophoyx intermedia</i>	LC
16	Great Egret	<i>Casmerodius albus</i>	LC
17	Western Reef-Egret	<i>Egretta gularis</i>	LC
18	Oriental Darter	<i>Anhinga melanogaster</i>	NT
19	Little Cormorant	<i>Phalacrocorax niger</i>	LC
20	Indian Cormorant	<i>Phalacrocorax fuscicollis</i>	LC
21	Great Cormorant	<i>Phalacrocorax carbo</i>	LC

5.2 Distribution of Heronries

In the present survey, a total number of 648 heronries were recorded. The maximum number was from Bharuch (n=456) followed by Ahmedabad (n=49), Gandhinagar (n=41), Dahod (n=20), Valsad (n=27), Bhavnagar (n=23), Surat (n=18), Kachchh (n=7), Mehsana (n=6), and Vadodara (n=1) districts of Gujarat respectively. Thus, the highest number of heronries were recorded in Bharuch whereas Vadodara district recorded the lowest number of heronries.

However, the probability of number of heronries and its extent could be much larger than that of reported / covered during the study. Suitable habitats for heronries can be found in almost every part of the state (except Ranns of Kachchh) Usually, heronries exist in wetlands near forests (e.g., in South Gujarat), inland wetlands (in all the regions of the state), coastal areas (Saurashtra, Kachchh), villages (all regions), cities/towns (all regions), and other human settlements (all regions) in the state. The heronries are widespread in the state,

covering all the districts. The reason for the widespread distribution of heronries in the state is that the state is endowed with a large number of natural and man-made wetlands like lakes, ponds, irrigation reservoirs, rice fields and marshes. These wetlands are the best sources for food for the nestlings.

SPECIES-WISE ACCOUNT OF HERONRIES

Total 20 species of birds were found breeding / nesting during the survey (Table 2) in different Heronries across the state.

Table 2: Heronry Birds for which Breeding was recorded in Gujarat During the BCSG Heronry Survey (2019)

SN	Common Name	Scientific Name	IUCN Red List & IWL Schedule I/II Threat Status
1	Painted Stork	<i>Mycteria leucocephala</i>	NT
2	Asian Openbill	<i>Anastomuso scitans</i>	LC
3	Woolly-necked Stork	<i>Ciconia episcopus</i>	NT
4	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT
5	Red-naped Ibis	<i>Pseudibis papillosa</i>	LC
6	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC, Sch-I
7	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	LC
8	Indian Pond-Heron	<i>Ardeola grayii</i>	LC
9	Grey Heron	<i>Ardea cinerea</i>	LC
10	Purple Heron	<i>Ardea purpurea</i>	LC
11	Striated Heron	<i>Butorides striata</i>	LC
12	Cattle Egret	<i>Bubulcus Ibis</i>	LC
13	Little Egret	<i>Egrett garzetta</i>	LC
14	Intermediate Egret	<i>Mesophoyx intermedia</i>	LC
15	Great Egret	<i>Casmerodius albus</i>	LC
16	Western Reef-Egret	<i>Egretta gularis</i>	LC
17	Oriental Darter	<i>Anhinga melanogaster</i>	NT
18	Little Cormorant	<i>Phalacrocorax niger</i>	LC
19	Indian Cormorant	<i>Phalacrocorax fuscicollis</i>	LC
20	Great Cormorant	<i>Phalacrocorax carbo</i>	LC

EGRETS

Cattle Egret (*Bubulcus ibis*)

Nesting colony survey for Cattle Egret covered a total of 144 potential heronry sites at 143 places). Nests were found present at 140 potential heronry sites. These nesting units (heronries) with Cattle Egret nesting were recorded in total 28 talukas and 11 districts of 6 administrative regions of Gujarat, viz., North Gujarat (2 districts, viz. Mehsana and Gandhinagar), Central Gujarat (2 districts, i.e. Dahod, Ahmedabad) and South Gujarat (3 districts, viz. Bharuch, Surat and Valsad), Kachchh and Saurashtra (Bhavnagar). The districts in which the Cattle Egret was found nesting were Dahod (2 talukas, viz. Dahod and Limkheda talukas), Bharuch (4 talukas viz. Amod, Bharuch, Hansot and Ankleshwar talukas), Surat (1 taluka, viz. Mangrol talukas), Valsad (two talukas, viz. Paradi, Dharampur talukas), Mehsana (1 taluka. Viz. Mehsana taluka), Gandhinagar (2 talukas, viz. Dehgam, Gandhinagar talukas), Kachchh (4 talikas viz Bhuj, Bhachau, Anjar, Mandvi), Bhavnagar (6 talukas viz. Bhavnagar, Ghogha, Sihor, Talaja and Mahuva) and Ahmedabad district (4 talukas viz., Bawla, Dholka, Dhandhuka, Dholera). A total of 8997 nests were recorded. Maximum number of nests of Cattle Egret nests were found in Bhavnagar (n= 2587) district(n=1673) and minimum number of its nests were found in Surat district (n= 115). Some other districts with relatively good number of Cattle Egret nests included Gandhinagar (n=1415) and Ahmedabad (n=1360), whereas number of nests in Mehsana (n=138), Dahod (n=311) and Valsad (n=474) was relatively low to moderate. A total of 4325 young ones were recorded. The maximum number of young ones at heronry sites were recorded in Bhavnagar district (n=2287), whereas the minimum number of young ones was recorded in Bharuch district (n=10). The number of young ones of Cattle Egrets in some other districts varied widely (e.g., Surat-0, Mehsana-20, Dahod-329, Valsad-354 yongones).

The highest number of adult birds on heronry sites was recorded in Bhavnagar (n=3311), followed by Gandhinagar (n=2332). In some other districts like Valsad (n=658), Bharuch (n=127) and Dahod (n=226), the number of adult birds recorded was low to moderate. In Surat and Mehsana, no adults were recorded at heronry sites.

Little Egret (*Egretta garzetta*)

Nesting of Cattle Egret was recorded in 61 "nesting units"/ heronries at 61 places. These places (heronries) with Little Egret nesting were recorded in total nine talukas and six districts of 4 administrative regions of Gujarat, viz. North Gujarat (1 districts, viz. Gandhinagar), Central Gujarat (1 district, i.e. Dahod), South Gujarat (3 districts, viz. Bharuch, Surat and Valsad) and Saurashtra (Bhavnagar). The districts in which the Little Egret was found nesting were Dahod (1 taluka, viz. Dahod taluka), Bharuch (3 talukas viz. Bharuch, Ankleshwar and Hansot talukas), Surat (one taluka, viz. Mangroltaluka) and Gandhinagar (one taluka, viz. Gandhinagar taluka), Valsad (two talukas, viz. Paradi, Dharampur talukas). A total of 391 nests were recorded. The maximum number of Little Egret nests were found in Bharuch district (n=240) and the minimum number of its nests were found in Gandhinagar district (n=6). Valsad (70 nests) and Surat (40 nests) can be considered districts with moderate number of nests. A total of 84 young ones were recorded. A total of 296 adults (parent birds) were counted.

Intermediate Egret (*Ardea intermedia*)

A total of 62 nesting colonies at 62 places were recorded. These places (heronries) with Intermediate Egret nesting were recorded in 8 talukas of 5 districts of 2 administrative regions of Gujarat, viz. South Gujarat (3 districts, viz. Bharuch, Surat, Valsad) and Saurashtra

(one district, viz. Bhavnagar). The districts in which the Intermediate Egret was found nesting were Bharuch (3 talukas viz. Bharuch, Ankleshwar and Hansot talukas), Surat (one taluka, viz. Mangrol taluka), Valsad (1 taluka, viz. Dharampur) and Dahod (one taluka, viz. Dahod taluka) and Bhavnagar (1 taluka viz, Bhavnagar). A total of 294 nests were recorded. The maximum number of Intermediate Egret nests were found in the Bharuch district (n=187), and the minimum number of its nests were found in the Bhavnagar district (n=21). Thirty four nests were recorded in Valsad, whereas 30 were recorded in Dahod. A total of 31 young ones of Intermediate Egret were recorded. A total of 76 adults (parent birds) were counted.

Great Egret (*Ardea alba*)

Nesting of Great Egret was recorded in 57 "nesting units"/ heronries at 57 places. These places (heronries) with Great Egret nesting were recorded in total 5 talukas and 4 districts of 3 administrative regions of Gujarat, viz. North Gujarat (1 districts, viz. Gandhinagar), South Gujarat (2 districts, viz. Bharuch and Surat) and Saurashtra (1 district, viz. Bhavnagar). The districts in which the Great Egret was found nesting were Bharuch (3 talukas viz. Bharuch, Ankleshwar and Hansot talukas), Surat (one taluka, viz. Mangrol taluka) and Gandhinagar (one taluka, viz. Gandhinagar taluka), Valsad (two talukas, viz. Paradi, Dharampur talukas) and Bhavnagar (1 taluka, viz. Mahuva). A total of 204 nests were recorded. The maximum number of Great Egret nests were found in Bharuch district (n=180) and minimum number of its nests were found in 2 district (n=8). A total of 26 young one of this species were recorded. They were recorded in Gandhinagar and Bhavnagar districts. A total of 37 adults (parent birds) were counted.

Western Reef Egret *Egretta gularis*

Nesting colony survey for Western Reef Egret covered a total 54 potential heronry. Nests were found present in 4 heronry sites (based on column U of excel). The surveyed

potential heronry sites with likely Western Reef Egret nesting were located in total 3 talukas and 2 districts of 1 administrative region of Gujarat, viz., South Gujarat (2 districts, viz. Bharuch and Surat), The districts in which the potential heronry sites for Western Reef Egret were Bharuch (2 talukas, viz. Ankleshwar and Hansot talukas) and Surat (1 taluka viz. Mangrol taluka). A total of 62 nests were recorded in total two talukas (Ankleshwar, Hansot) of one districts (Bharuch). Among the talukas and districts in which nests were recorded, maximum number of nests of Reef Egret nests were found in Hansot taluka of Bharuch district (n=42) and minimum number of nest (n=20) were found in Ankleshwar taluka of Bharuch district. No young ones were recorded. A total of 20 adult birds were recorded (all in Hansot taluka of Bharuch district).

HERONS

Grey Heron *Ardea cineria*

Nesting of Grey Heron was recorded in total 2 "nesting units"/ heronries at total 2 places. These places (heronries) with Grey Heron nesting were recorded in total 2 talukas and 2 districts of 2 administrative regions of Gujarat, viz. North Gujarat (1 district, viz. Gandhinagar), and South Gujarat (1 district, viz. Bharuch). The districts in which the Grey Heron was found nesting were Bharuch (one taluka, viz. Jhagadia taluka) and Gandhinagar (one taluka, viz. Gandhinagar taluka). A total of 16 nests were recorded. Maximum number of nests of Grey Herons were found in Bharuch district (n=15) and minimum number of its nests were found in Gandhinagar district (n=1). A total of 11 young ones (10 in Bharuch district, Jhagadia taluka and 1 in Gandhinagar district/taluka) and 21 adults/parents (19 in Jhagadia taluka, Bharuch district and 2 in Gandhinagar district/taluka) were recorded at nesting units/heronries having this species' nests.

Indian Pond Heron (*Ardeola grayii*)

Indian Pond Heron's nesting was recorded in 63 "nesting units"/ heronries at 63 places. These places (heronries) with Pond Heron nesting were recorded in total 7 talukas and 6 districts of 4 administrative regions of Gujarat, viz. North Gujarat, Central Gujarat, South Gujarat and Saurashtra. The districts in which the Pond Heron was found nesting were Bharuch in South Gujarat (2 taluka, viz. Anleshwar and Hansot talukas), Surat district in South Gujarat (1 taluka, viz. Mangrol taluka), Valsad district in South Gujarat (2 talukas, viz. Paradi and Dharampur talukas), Dahod district in Central Gujarat (1 taluka, viz. Dahod taluka), Mehsana district in North Gujarat (1 taluka, viz. Mehsana taluka) and Bhavnagar district (1 taluka viz. Bhavnagar) in Saurashtra. A total of 125 nests were recorded. The maximum number of Pond Heron nests were found in Valsad district (n=50) and the minimum number of its nests were found in Mehsana district (n=2). Other districts having Pond Heron nests were Bhavnagar (n= 30) Dahod (n=17), Bharuch (n=16) and Surat (n=10). A total of 57 young ones (44 in Valsad district, 7 in Dahod district, 6 in Bhavnagar district) and 206 adults/parents (126 in Valsad district, 44 in Dahod, 33 in Bhavnagar and 3 in Mehsana district) were recorded at the nesting units/heronries having this species' nests.

Purple Heron *Ardea purpurea*

Nesting of Purple Heron was recorded in total 58 "nesting units"/ heronries at total 58 places. These places (heronries) with Purple Heron nesting were recorded in total 4 talukas and 3 districts (Bharuch, Surat, Gandhinagar) of 2 administrative regions of Gujarat, viz. North Gujarat (1 district, viz. Gandhinagar) and South Gujarat (2 districts, viz. Bharuch and Surat districts). The districts in which the Purple Heron was found nesting were Bharuch (2 taluka, viz. Ankleshwar, Hansot talukas) and Gandhinagar district (one taluka, viz. Gandhinagar taluka) and Gandhinagar district (one taluka, viz. Gandhinagar taluka). A total of 69 nests were recorded (in Ankleshwar, Hansot and Gandhinagar talukas). Maximum number of nests of Purple Heron were found in Bharuch district (n=55; 45 in Ankleshwar and

10 in Hansot talukas) and minimum number of its nests were found in Gandhinagar district (n=14; all in Gandhingar taluka). No young ones were found in the nests. However, 13 adults were recorded in the nesting colonies (all in Gandhinagar district).

Striated Heron *Butorides striata*

Nesting of Striated Heron was recorded in total 2 "nesting units"/ heronries at total 2 places. These places (heronries) with Striated Heron nesting were recorded in total 2 talukas and 2 districts of 1 administrative region of Gujarat, viz. North Gujarat (2 districts, viz. Mehsana, Gandhinagar). The districts in which the Striated Heron was found nesting were Mehsana (1 taluka, viz. Mehsana) and Gandhinagar (1 taluka, viz. Gandhinagar). A total of 10 nests were recorded. Maximum number of nests of this heron were found in Gandhinagar district (n=10) and minimum number of its nests were found in Mehsana district (n=1). No young ones were recorded. However, 3 adults/parents were recorded at nesting sites (2 in Gandhinagar district/taluka, 1 in Mehsana district/taluka).

Black-crowned Night Heron *Nycticorax nycticorax*

The nesting of Black-crowned Night Heron was recorded in 64 "nesting units"/ heronries at 64 places. These places (heronries) with the Black-crowned Night Heron nesting were recorded in total 11 talukas and 7 districts of 4 administrative regions of Gujarat, viz. North Gujarat (2 districts, viz. Gandhinagar & Mehsana districts), Central Gujarat (1 district, viz. Dahod district), South Gujarat (3 districts, viz. Bharuch, Surat and Valsad districts) and Saurashtra (1 district, viz. Bhavnagar). The districts in which the Night Heron was found nesting were Gandhinagar (2 taluka, viz. Gandhinagar and Dehgam talukas), Dahod (1 taluka, viz. Dahod taluka), Bharuch (2 talukas, viz. Ankleshwar and Hansot talukas), Surat (1 taluka, viz. Mangrol taluka), Valsad (2 talukas, viz. Dharampur and Paradi talukas) and Bhavnagar (23 talukas, viz. Bhavnagar and Mahuva). A total of 479 nests were recorded. The maximum number of Night Heron nests were found in Bharuch district (n=151), and the minimum

number of its nests were found in Mehsana district (n=8). Dahod district had a very high (second highest) number of Black-crowned Night Heron nests (n=140). Other districts had a low to moderate number of nests of this species (e.g., Gandhinagar-21, Surat-30, Bhavnagar-46, Valsad-83 nests). A total of 80 young ones (68 in Valsad district, 10 in Dahod and 2 in Gandhinagar district) and 497 adults/parents (199 in Dahod district in its Dahod taluka, 182 in Valsad district in its Paradi and Dharampur talukas, 52 in Gandhinagar district in its Gandhinagar and Dehgam talukas and 56 in Bhavnagar in its Bhavnagar and Mahuva talukas) were recorded at the nesting units/heronries having this species' nests.

CORMORANTS & DARTERS

Darter (*Anhinga melanogaster*)

The only nesting colony of Darter was recorded in the Kachchh district. A total of 25 nests were recorded in the district's Chobari village of Bhachau taluka. There were a total of 25 nests with 20 adult birds.

Little Cormorant (*Microcarbo niger*)

Little Cormorant's Nesting was recorded in 16 "nesting units"/ heronries at total 16 places. These places (heronries) with Little Cormorant nesting were recorded in total 7 talukas and 5 districts (Bharuch, Valsad, Gandhinagar, Bhavnagar and Kachchh) of 4 administrative regions of Gujarat, viz. North Gujarat (1 district, viz. Gandhinagar) and South Gujarat (2 districts, viz. Bharuch and Valsad districts), Saurashtra (1 districts, viz. Bhanagar) and Kachchh. The districts in which the Little Cormorant was found nesting were Bharuch (2 taluka, viz. Ankleshwar, Hansot talukas), Valsad distret (one taluka, viz. Paradi taluka) Gandhinagar district (one taluka, viz. Gandhinagar taluka), Bhavnagar (1 taluka, viz. Bhavnagar) and Kachchh (2 talukas, viz. Bhachau and Mandvi). A total of 224 nests were recorded. The maximum number of nests of Little Cormorants were found in Bharuch district

(n=123) and the minimum number of its nests were found in Valsad district (n=10). A total of 30 young ones (18 in Gandhinagar district, 8 in Valsad district) and 143 adults/parents (23 in Bhavnagar taluk in Bhavnagar district, 47 in Bhachau and Mandvi taluk of Kachchh district, 20 in Bharuch district, Hansot taluka, 33 in Gandhinagar district/taluka and 20 in Valsad district, Paradi taluka) were recorded at the nesting units/heronries having this species' nests.

Indian Cormorant (*Phalacrocorax fuscicollis*)

Nesting of Indian Cormorant was recorded in total 12 "nesting units"/ heronries at total 11 places. These places (heronries) with Indian Cormorant nesting were recorded in total 11 talukas and 7 districts (Bharuch, Surat, Valsad, Ahmedabad, Gandhinagar, Mehsana and Bhavnagar) of 4 administrative regions of Gujarat, viz. North Gujarat (2 districts, viz. Mehsana and Gandhinagar), South Gujarat (3 districts, viz. Bharuch, Surat and Valsad districts), Central Gujarat (1 district, viz. Ahmedabad) and Saurashtra (1 district, viz. Bhavnagar). The talukas in which the Indian Cormorant was found nesting were Ankleshwar and Hansot talukas of Bharuch district, Mangrol taluka of Surat district, Kaprada taluka of Valsad district, Dholka and Dholera talukas of Ahmedabad district, Dehgam and Gandhinagar talukas of Gandhinagar district, Mehsana taluka of Mehsana district and Sihor taluka of Bhavnagar district. A total of 190 nests were recorded. Maximum number of nests of Indian Cormorants were found in Bharuch district (n=258) and minimum number of its nests were found in Mehsana and Bhavnagar district (n=2). A total of 14 young ones (3 Mehsana district and taluka, 6 in Valsad district, Kaprada taluka and 5 in Sihor taluka of Bhavnagar district) and 95 adults/parents (in Bharuch district's Ankleshwar & Hansot taluka, in Surat district's Mangrol taluka, in Mehsana district's Mehsana taluka, in Gandhinagar district's Gandhinagar & Dehgam talukas, in Valsad district's Kaprada taluka and Bhavnagar district's Sihor taluka) were recorded at the nesting units/heronries having this species' nests.

Great Cormorant (*Phalacrocorax carbo*)

This species was recorded nesting at two places, i.e. in Amboli village, at another site (Hindustan Petroleum Co.) in Ankleshwar taluka of Bharuch district. Though, the enumerators have not provided details for Amboli village, the enumerator has reported 150 nests with small young ones for the Hindustan Petroleum Co. site.

STORKS

Painted Stork (*Mycteria leucocephala*)

During the survey, only nesting colony recorded from the Kachchh district where a total of 30 nests were recorded at Topansar lake in Mandvi city. In this colony, a total of 55 adults and 70 young ones were also recorded. It is noteworthy that the nesting colony of Bhavnagar, remains unreported during the survey. This may be due to the timings of the survey which is primarily between July to September. The heronries in Bhavnagar region is the largest Painted Stork nesting colony in the state of Gujarat where the number of nests increased from 96 in 1980 (Parasharya and Naik, 1990) to 500 in 2005 (Gadhavi, 2005)[#]. The recent study by Gohel et al. (2021)[§] records as many as 217 nests in Bhavnagar city. This highlights the need of an hour to conduct heronry surveys not only during the monsoon but also during post-monsoon.

Asian Openbill (*Anastomus oscitans*)

Nesting colony survey for Asian Openbill covered a total 10 potential heronry sites (at total 10 places). Nests were found present at all the 10 potential heronry sites. These nesting sites that were surveyed were recorded in total 9 talukas and 5 districts of 3 administrative regions of Gujarat, viz., North Gujarat (1 districts, viz. Gandhinagar), Central Gujarat (3 districts, i.e. Dahod, Ahmedabad, Vadodara) and South Gujarat (1 district, viz. Valsad). The districts in which the Asian Openbill was found nesting were Dahod (1 talukas, viz. Dahod), Vadodara (1 talukas viz. Padra taluka), Valsad (two talukas, viz. Umargam, Valsad talukas),

Gandhinagar (2 taluka. viz. Gandhinagar and Dehgam talukas), and Ahmedabad district (3 talukas viz., Dholka, Bawla, Dholera). A total of 627 nests were recorded. Among the districts in which Asian Openbill nests were recorded, maximum number of nests of Asian Openbill were recorded in Valsad district (n=504) and minimum number of its nests were found in Gandhinagar district (n= 3). Some other districts with relatively good number of Asian Openbill's nests included Dahod (n=51) and Ahmedabad (n=60), whereas number of nests in Vadodara was also low (n=9). A total of 501 young ones were recorded. Maximum number of young ones at heronry sites were recorded in Valsad district (n=422), whereas the minimum number of young ones were recorded in Vadodara district (n=6). Number of young ones of Asian Openbill in Dahod district was moderately high (n=73).

A total of 304 individuals of adult Asian Openbill were recorded at heronries. Highest number of adult birds on heronry sites was recorded in Valsad (n=182), though in Dahod district, their numbers were high too (n=101). Number of adult birds of Asian Openbill at heronries was low (i.e., 6 in Gandhinagar and 15 in Vadodara).

Woolly-necked Stork (*Ciconia episcopus*)

Nesting colony survey for Woolly-necked Stork covered a total 2 potential heronry sites (at total 2 places). Nests were found present at both the potential heronry sites. These nesting sites that were surveyed were recorded in total 2 talukas and 1 district of 1 administrative region of Gujarat, viz., North Gujarat. The district in which the Woolly-necked Stork was found nesting was Gandhinagar (2 talukas, viz. Gandhinagar and Dehgam). A total of 3 nests were recorded. Among the talukas of Gandhinagar district in which Woolly-necked Stork's nests were recorded, higher number of nests (n=2) were recorded in Dehgam taluka and lower number of nests (n=1) were found in Gandhinagar taluka. A total of 2 young ones were recorded in Gandhinagar district (1 each in each taluka). A total of 6 individuals of adult

Woolly-necked Storks were recorded at their nests (2 adult birds at the nests in Gandhinagar taluka and 4 birds in Dehgam taluka).

IBIS

Black-headed Ibis (*Threskiornis melanocephalus*)

The nesting colony survey for Black-headed Ibis covered 17 potential location of heronry sites (at total 17 places). Nests were found present at the 15 potential heronry sites. These nesting sites that were surveyed were recorded in total 9 talukas of 6 districts of 4 administrative regions of Gujarat, viz., North Gujarat (1 districts, viz. Gandhinagar), Central Gujarat (2 districts, i.e. Dahod, Ahmedabad) and South Gujarat (2 district, viz. Bharuch and Surat) and Saurashtra (1 district, viz. Bhavnagar) . The districts in which the Black-headed Ibis was found nesting were Dahod (1 taluka, viz. Dahod), Gandhinagar (2 talukas. viz. Gandhinagar and Dehgam talukas), Ahmedabad district (3 talukas viz., Dholka, Bawla, Dholera), Bharuch (1 taluka, viz. Ankleshwar) Surat (1 taluka, viz. Mangrol) and Bhavnagar (1 taluk, viz. Sihor). A total of 642 nests were recorded. Among the districts in which Black-headed Ibis's nests were recorded, the maximum number of nests of this Ibis were recorded in Gandhinagar district (n=396) and the minimum number of its nests were found in Bhavnagar district (n= 3). Some other districts with relatively good number of Black-headed Ibis's nests included Dahod (n=100), Ahmedabad (n=70), Surat (n=70) and Bharuch (n=30). A total of 329 young ones were recorded. The maximum number of young ones at heronry sites was recorded in Gandhinagar district (n=279), whereas the minimum number of young ones was recorded in Dahod district (n=50). In Ahmedabad, Bharuch, Surat and Bhavnagar districts, no young ones were recorded. A total of 731 individuals of adult Black-headed Ibis were recorded at nests. The highest number of adult birds on heronry sites was recorded in Gandhinagar (n=675). In Dahod and Bhavnagar district, a total of 50 and 6 adult birds were recorded respectively. No adult birds were recorded in other districts at nests.

Red-naped Ibis (*Pseudibis papillosa*)

Four nests were recorded in Bawla taluka of Ahmedabad district, but no young ones were recorded. Two more nesting colonies were recorded in the Kachchh district where colonies were recorded in Anjar and Mandvi taluk. In Kachchh, a total of 28 nests with 62 adult birds were recorded. No young ones were recorded in Anjar while in Mandvi, 70 young ones were recorded. It might be noted that though this Ibis is a solitary nester, it is included in this survey report as it rarely nests in small parties and as Subramanya (1996) had included this species in his pioneering nationwide effort on the national heronry surveys.

EURASIAN SPOONBILL *Platalea leucorodia*

Eurasian Spoonbill nesting was recorded in only Bhavnagar city in the Saurashtra region. A total of six nesting colonies of the species were recorded. In these, a total of 121 adults were recorded. No young ones were recorded at these nesting colonies except the colony located at B.M. Commerce High School in Bhavnagar city.

CONCLUSIONS

In the heronry survey by BCSG, heronries were recorded in 10 districts of Gujarat, viz. Mehsana, Gandhinagar, Dahod, Ahmedabad, Vadodara, Bharuch, Surat, and Valsad districts. Of the 22 species of heronry forming birds known to occur in Gujarat, 18 species (82%) were recorded during the heronry surveys carried out from July to Sept. 2019 by BCSG. They included 5 species of egrets (i.e. 100% of egret species and 22.7% of all the heronry species known to breed in Gujarat), 5 species of herons (i.e. 100% of heron species known to breed in Gujarat), 3 species of cormorants (i.e. 100% of cormorant species known to breed in Gujarat), 2 species of storks (i.e. 50% of storks' breeding species in Gujarat), 1 species of spoonbill (i.e. 100% of spoonbill's breeding species in Gujarat), 2 species of Ibis (i.e. 66.6% of ibis breeding species in Gujarat).

The summary of number of nesting sites, number of nests and average nests per heronry for each species is given below.

Table 3: Average nests per Heronry recorded during the survey

SN	Common Name	Number of Nesting sites	Number of nests	Average nests per heronry
1	Painted Stork	1	30	30.0
2	Asian Openbill	10	627	62.7
3	Woolly-necked Stork	2	3	1.5
4	Black-headed Ibis	17	642	37.8
5	Indian Black Ibis	3	32	10.7
6	Eurasian Spoonbill	6	68	11.3
7	Black-crowned Night-Heron	64	479	7.4
8	Indian Pond-Heron	63	125	1.9
9	Grey Heron	2	16	8.0
10	Purple Heron	58	69	1.2
11	Striated Heron	2	10	5.0

12	Cattle Egret	144	8997	62.5
13	Little Egret	61	391	6.4
14	Intermediate Egret	62	294	4.8
15	Great Egret	57	204	3.6
16	Western Reef-Egret	54	62	1.1
17	Indian Darter	1	25	25
18	Little Cormorant	16	224	12.3
19	Indian Cormorant	12	190	17.1
20	Great Cormorant	2	150	75

- From the viewpoint of the number of nests and the number of nesting sites, the Cattle Egret was found to be the most abundant species during the survey.
- It is noteworthy to mention here that about 627 nests of Asian Openbill were recorded, but these nests have been recorded in only 10 colonies/sites. It indicates the highest density of nests recorded under the survey. Even it is more than that Cattle Egret which is abundant species in the survey.
- Density of some of the species such as Pond heron, Western-Reef Egret, Purple Heron was less. The likely reason is that these species mainly form heronries in association with other species.

References and further readings

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