A Report on Heronary in Mahad Taluka Dist Raigad Maharashtra

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Introduction

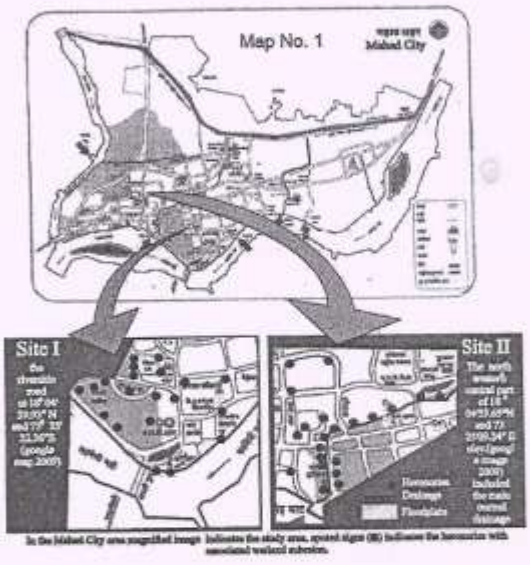
Raigad district is situated along the west coast of Maharashtra and is located between latitude N 17° 51' and 19° 08' and longitude E 72° 50' and 73° 40'. Mahad is an urbanised area on the bank of River Savitri and has historical importance. It is well known port used for import and export of goods through Savitri river creek basin since historical period.

The natural floodplain lakes, the hydrological variability of flood zone of Mahad contributes substantially to the environment for flora and fauna. The town also consists of lakes named as Chawdar Lake, Kakar Lake, Koteshwari Lake, Vireshwar Lake, Hapshi Lake, Gadi Lake. The lakes were lined by wild vegetation and filled partially with lotus and other weeds showed the presence of Ardeidae family birds like bitterns egrets and herons, family - Anatidae - ducks, family – jacanidae - jacanas, family - Scolopacidae - snipes and sandpipers, family - Pedicipedae - grebs etc. and many other waders were noted. It was the period of 1980 to 1990s when Mahad was well known for migratory birds roosting and nesting sites. But due to industrialization and launch of urban development projects from 1990 the paddy fields, the lakes have been reclaimed for construction purposes. The pressure of this has polluted the land form and has changed not only physical factors but also the whole biome.

The study was started to observe nesting colonies of egrets herons and cormorants from 1996 to 2000. The axing of nesting trees and increasing pollution have been responsible for the declining number of birds. Indiscriminate use of pesticides has been a major environmental issue due to their toxicity, persistence, health problems and endocrine effects (Webel et al 2010). These materials do not undergo degradation and remain in the soil affecting the dynamic ecosystem (Sing 2001). Pesticides may reach the soil through direct application and invade the top few inches of soil (Mc Even and Stephenson 1979). The impact of pesticide residues on soil health includes risk of injury and death of non target species like insects which form major component of diet for egrets and herons particularly during breeding season.

Site I and II
Distribution of Heron and Egrets nesting colony sites

In the Mahad City area
Bold Dash lines (----) indicates the study area.
spoted signs (O) indicates the heronocies with associated wetland subregion.



Stud y location

The study area comprises of area affected by flood plains in Mahad Taluka, District Raigad. Two sections from Mahad city were selected having dense nesting sites. The south eastern river lined road situated in 18°04' 43.04" N and 73°25'18.80" E (Google image 2009). The Vireshwar lake and Tambad bhuvan area, the fish market and Kumbhar lane. The other one was north western central part of 18°04'53.65"N and 73°25'09.24" E (Google image 2009) included the main city's central nullah, Chawdar Lake, Phule market area. The climate of the district is typical of west coast with regular heavy yet seasonal rainfall (average rainfall is about 3942mm Raigad Gazette pg 172) and high humidity throughout the year. The stagnant flood water at Mahad basin with alluvial organic matters provides the larvae, fish, tadpoles, reptiles and amphibian rich food for egrets, herons and many migratory and waders (Dune and Leopold 1978). The city's main drainage passes from east to south west

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part (map no. T1) and opens in to the river Savitri. The heronaries are of natural floodplains and consist of crowded places. Lakes with hydrological variability contribute substantially to nesting habitat of birds. It is also considered to be vital part of river as it is rich in nutrient cycling process, the spawning success of fishes, and tadpoles, and nearest foraging area.

Most of the heronaries are situated in the private compound and crowded public place of the city. These two areas are sharing the river side lanes and major drainage (nullahs) the central lakes, the sewage, and dumping areas. Thus, the area shows the streaming of sewage and the water flow to meet the river at ghats of kumbhar ali and khot ali etc.

Material and methods

The egrets, herons and nesting trees were identified by using Field Guides of Dr. Salim Ali and D Ripley's The Book of Indian Birds (1996) and the book of Indian Trees by S. D. Mahajan (2002). The present study is to report observations made in year 1997 and 2000, by regular visits and awareness programmes conducted in Mahad. Survey of the "Heronaries", the bird's nesting colony was done during breeding season from the month of June to September. The pre-breeding and post-breeding activities were also been noted. The data was collected by visiting various places to check the problems of heronaries and the remedies to conserve and protect the nests. To start, attempts were done initially by involving municipal council and other government bodies like forest dept so as to have proper legal pressure and authenticity to initiate conservation activity.

Observation sites were selected according to flood level zone, the urban sewage caring drainage (nullahs) and the dense populated area of the bird's nesting trees.

The observations were made by visiting the site and interacting with the owners of private compounds where the Heronaries have been found.

The records were made twice a week and the data has been collected monthly to discuss the future applications. Each site was visited on regular basis to understand the problems of heronaries and other related activities during breeding periods. Further action plan decided accordingly.

Results and discussion

The Heronaries are the trees which are used by egrets and herons for purpose of nesting and breeding activities. The table no. 1 and no. 2 depicts drastic fall in the population of egrets and herons in the study area. This data clearly shows decreasing number of heronaries, and consequently the number of birds and their nests.

Table 1: Number of nests in the study area and the total population observed in the year 1997 and 2000

Name of study Area	No. of trees (heronaries)		Avg. Nests on each Heronary		Total No. of Nests		Mat. And Pat. Population		Mat. and Pat. population + Individual Pltn.		Total Population	
	1997	2000	1997	2000	1997	2000	1997	2000	1997	2000	1997	2000
The Savitri river side road area East Southern part of Mahad. Vireshwar lake, Tambad Bhuwan, Police Line near, Raja Ghat, Schools Area, ITI area, Kumbhar Lane, BhoiLane, etc.	36	12	30	30	1080	360	2360	720	4720	1440	4720 ±	1440 ±

Table 2 : Number of nests in the study area and the total population observed in the year 1997 and 2000

Name of study Area	No. of trees (heronaries)		Avg. Nests on each Heronory		Total No. of Nests		Mat. and Pat. population		Mat. and Pat. population + Individual Pltn		Total Population	
	1997	2000	1997	2000	1997	2000	1997	2000	1997	2000	1997	2000
The Central Mahad and Main Drainage (Nallahs) area Chavadar Tale, Fule Market, Fish market yard, Gandhi Talkies-Gaval lane, Dongari Lane, etc.	54	16	30	30	1620	480	3240	960	6480	1920	6480 ±	1920 ±

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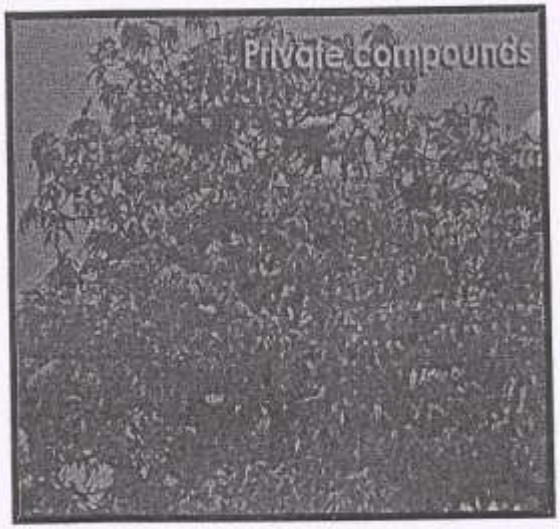

Fig. 1: Nest in Private Compounds.

Fig 2: Mixed population.

These selected sites supported the egrets and herons colonies from 1994 to 1997. The abundance of nests of all these species was stable or increased in the year mentioned. The concentrated population area of the heronaries was observed to be the river side road, lakes, city's main drainage and fish market.

But the observations of the year 2000 show drastic fall in the number of birds as compared to the number of nests counted. The sites were developed for reconstruction of drainage (nallahs) and the buildings, new cement road under township planning by Mahad Municipal department. In this development plan the roadside heronaries and heronaries around the lake bordered were cut down. This data proves that urban development directly affects number of nesting sites of birds.

The urbanization has put great and rapid pressure on the nesting sites of the birds. The local people have destroyed their old Mangalore roofed houses with the specious gardens and compounds etc to construct the buildings for getting better housing facilities and also revenue. To achieve this development, largest paddy fields of Mahad area were filled by debris from nearby hills. This is considered the first cause of deterioration of habitat. The subsequent problem was due to polluted water and vanishing lakes and reservoirs.

Beautification of lakes for tourism is the next reason for adversely affecting the heronaries existence. The lakes reclaimed for renovation projects were the Chawdar lake, Vireshwar lake, Koteshwari lake, etc. beautification of these lakes was planned and executed without considering importance of huge old trees as heronaries. The tiled and fenced walkways were constructed leading to lakes. These have become stagnant brackish ponds rather than previous lakes with natural glory.

The other common problems generated by heronaries are droppings and other wastes of the nests. These birds are colonial nesters. Each colony consists of minimum 20 and maximum 120 nests on a single tree. Bird droppings and waste falling from nests contain fishes, crabs, tadpoles, snakes, eggs, chicks, sticks, etc. observed in mass debris. These materials decay and stench making it unbearable for humans to live in the vicinity. Therefore, owners of these lands either throw out the nests by hiring tribals [adivasis]. Sometimes fire crackers were used to drive away birds. People were observed cutting down branches or trees which the birds were nesting. Such acts force these bird to leave their routine nesting places instead the birds selected other trees like rain tree, acacia, fig tree, etc. In such a case, the falling of chicks and eggs was observed. The most suited trees for nesting sites or heronaries were trees like mango, tamarind, banyan, Glyricidia etc.

On considering the above points, an action plan to save the heronaries was designined. Land owners were requested to save the heronary trees while planning their buildings. Many of them have appreciated our attempts and have responded positively for conservation of nesting sites. Staff was appointed and volunteers were invited to clean the droppings and waste after communicating with the land owners. Site proposed for residential hubs are not being available for maintaining heronaries. These townships

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happen to carry sociopolitical values. Schools and public are being focused for conservation and protection of heronaries. Appropriate participation of municipal council is being solicited in these activities. Planting of trees suitable as heronaries is being considered so as to have nesting sites in future, new sites are identified annually by field visits and are being developed. Persistent awareness attempts and regular field work for decades have made presence of egrets and herons noticeable for the residents. Wetland birds are supposed to be an important indicator of the degraded and deteriorated ecosystem. The study also reveals that though the pollution, constructions, drainage, sewage and debris of urban waste problems has proved to be signs of deteriorated environment, best of efforts can be made to conserve the bird species in the area.

Conclusion

There has been considerable success in conserving the nesting sites at surveyed area. Yet, more inputs are needed to keep it regular during breeding periods. The data about nesting sites of birds and their problems has solicited the need for conservation of nesting sites of these birds in time to come. In view of this, awareness programs were taken up to convey the importance of heronaries and the breeding of the birds.

Acknowledgements

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