

FORAGING BEHAVIOUR OF PELICANS IN KOKKARE BELLUR, MADDUR, KARNATAKA, INDIA.

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ABSTRACT

The present study reveals the foraging behaviour of spotted billed pelicans as well as the physico-chemical parameters of Guraderahalli tank which helps in nurturing the ecosystem. 'Kokkare Bellur' area was one of the important villages located in Mandya district, Karnataka it's been declared as significant Pelican diversity area of Asia among the other Sanctuaries coming under Asian Wetland Bureau and IUCN (1988). The spotting of Pelicans and Painted storks and other species highlights the importance of Kokkare bellur Sanctuary as a significant region for bird habitat in Karnataka. Foraging is the process of searching food and exploiting food resources by the adult pelicans and feeding the same to their young ones. Base line survey was conducted during their active periods November 2018 to March 2019 in the entire study area. Nesting is usually constructed on large tree species like Banyan tree, Albizia tree or tamarind tree as they provide safe for spot billed pelican in and around Kokkare Bellur. The different fish varieties like rohu, catla, common shiner and other common types were selected for feeding which is one of the characteristic features of foraging behaviour. On the other hand pellets were also analyzed to identify the type of components which is present in the body. The physico-chemical parameters were done to known quality as well as components present in the water sample periodically. Hydrologic conditions can directly modify or change chemical and physical properties such as nutrient availability, degree of substrate anoxia, soil salinity, sediment properties and pH. These modifications of the physio-chemical environment, in turn, have a direct impact on the biotic response in the region. Keeping all these in view conservation strategies has to be undertaken in conserving the pelicanry sanctuary in Kokkare Bellur.

KEYWORDS: Kokkare bellur, binoculars, foraging behaviour, baseline survey, physico-chemical, pellet analysis.

INTRODUCTION

Foraging is the process of searching food and exploiting food resources by the adult pelicans and feeding the same to their young ones [1]. The different fish varieties like rohu, catla, common shiner and other common types were selected for feeding which is one of the characteristic features of foraging behavior [2]. Kokkare Bellur, is a small village popular for its bird sanctuary situated at a distance of around 12 km from Maddur. The village is located 800 metres to the west of the Shimsa River. The area in the vicinity of the village offers large water bodies in the form of several large tanks such as Tailur Kere, Maddur Kere and Sole Kere that sustain food needs like fishes and shell fishes to the pelicans and other birds. Nobody knows why storks and pelicans, both exclusively fish eaters; persist in breeding in Kokkare bellur, which is several kilometers from any substantial water body, which is certain that both species come here to breed from several generations- according to village legend, for hundreds of years. 'Kokkare Bellur' area is one of the important villages located in Mandya district, Karnataka which has been declared as significant Pelican diversity area of Asia among the other Sanctuaries coming under Asian Wetland Bureau and IUCN (1988). [3] The village area has been declared as a Pelican sanctuary by Tourism division of Karnataka Government.

The type of pelican found in this region is spotted billed pelican with scientific name *Pelecanus philippensis*. The classification is as follows;

SCIENTIFIC CLASSIFICATION	
Kingdom	Animalia
Phylum	Chordata
Class	Aves
Order	Pelecaniformes
Family	Pelicanidae
Genus	<i>Pelecanus</i>
Species	<i>philippensis</i>

DESCRIPTION OF SPOTTED BILLED PELICAN

The body is 125 to 160 cm long and weighs about 4 – 6 kg. The body is usually whitish in color with grey crest, hind neck and a brownish tail. Beak is usually long measuring about 32 – 34 cm in length in adults. The feathers on the hind neck are curly and form a greyish nape crest. The pouch is pink to purplish and has large pale spots, and is also spotted on the sides of the upper mandible. The tip of the bill (or nail) is yellow to orange. In breeding plumage, the skin at the base of the beak is dark and the orbital patch is pink. It attains the stage of maturity at 3 years.



Fig: 1 ADULT MALE



Fig: 2 YOUNG ONES [MALE & FEMALE]

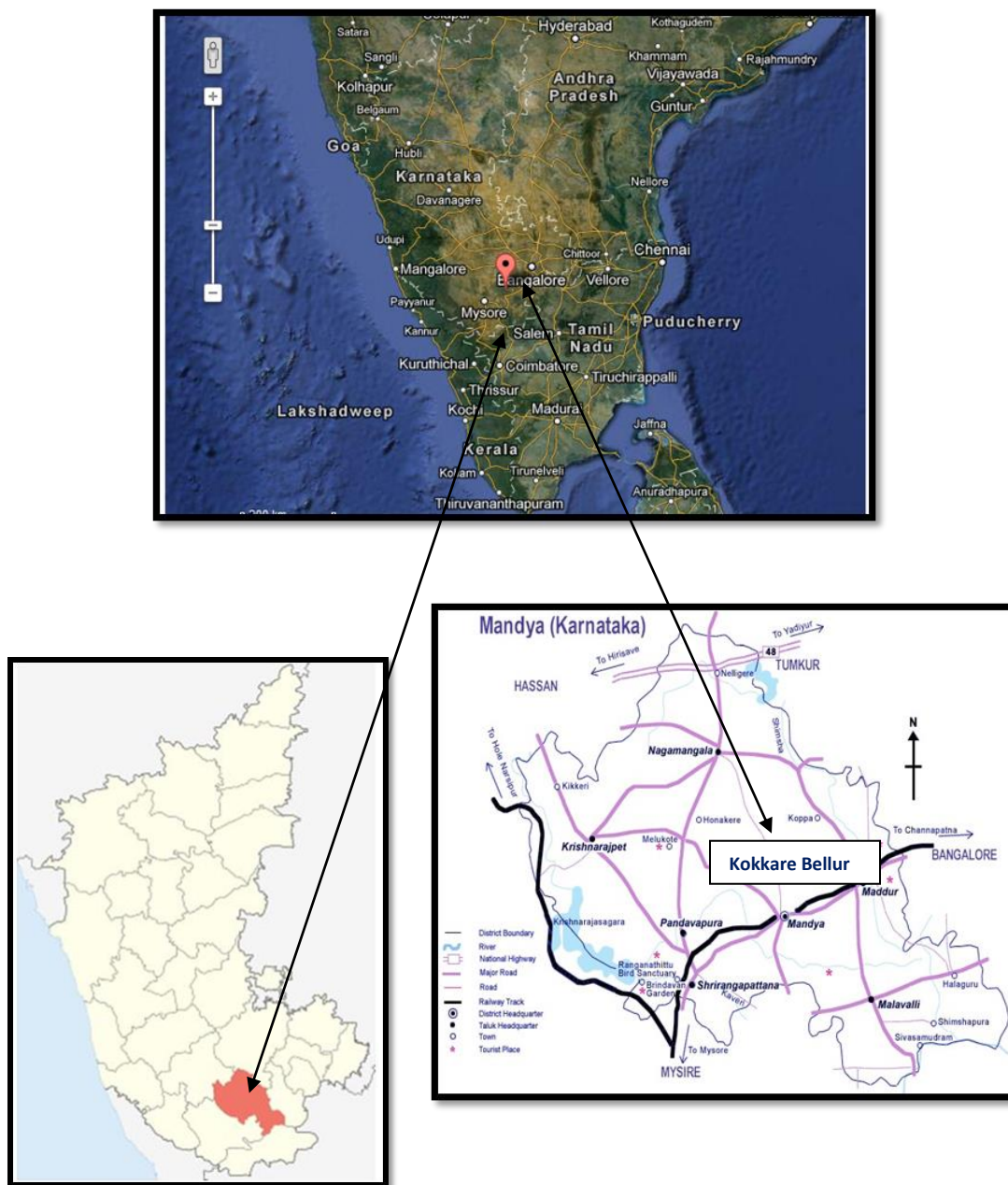


Fig: 3 ADULT FEMALE

In addition to these morphological characters they also show sexual dimorphism which plays very significant role at the time of reproduction. Males are usually larger in size compared to females. The beak is longer than females measuring 32-34 cm in adult; while that of female is 30-32cm. Other morphological features remain same in both male and female. The presence of webbed feet is one of the distinct features which help them in swimming.

STUDY AREA

Kokkare Bellur village popularly known as the “stork village” is situated (12°13’N, 77°0’E) in Mandya district of the south Indian state of Karnataka. Kokkare Bellur is situated 2600 ft metres to the west of Shimsa River. Within a few km radius of the village lie numerous irrigation tanks – like Sule Kere, Malavalli Kere, Koppe Kere, Marehalli Kere, Shetty Kere, and Karanji Kere which are important feeding grounds for the birds nesting at Kokkare Bellur. The annual rainfall is about 525 mm over this slightly undulating terrain, with an average altitude of about 850 msl. The area is a typical dry land village in southern India with its cultivated and fallow fields, cactus hedges, and trees in the fields and villages. The village has about 2000 people, and a 22 percent literacy rate. Two-thirds of the population belongs to the vokkaliga community, mainly farmers. Kokkare Bellur is inhabited by spotted billed pelicans (*Pelecanus philippensis*) and painted storks (*Mycteria leucocephala*) which have migrated in their hundreds, from the lakes of South Karnataka.



METHODOLOGY

The field study was undertaken periodically carried out during winter season between (October – May) of 2018 to 2019 to study the foraging behavioral pattern of pelicans.() Base line survey was undertaken at regular intervals using 22 X 50 Nikon binoculars and high resolution camera. Foraging behaviour was simultaneously recorded using time budget activity table. [4] The behavioral pattern of feeding habitat was done by splitting the time at regular intervals from 6:00 AM to 6:00 PM. In addition, opportunistic records were also collected

during other time periods of the day. Birds seen were recorded along with habitat type, season and frequency of sightings of a particular species. [5] Apart from baseline survey; pellet analysis was done by collecting the sample and sent to laboratory to assess the components present in the pellets which has ecological importance as biological manure in the ecosystem. The physico-chemical parameters was also assessed by collecting the water sample in the Guruderahalli tank to study the influence of ecological parameters on the foraging / feeding behaviour of the pelicans.



Fig: 4 GURUDERAHALLI –TANK



Fig: 5 PELLETS OF PELICANS

RESULTS AND DISCUSSION

Spotted billed pelicans are the only tree species in Kokkare Bellur; while the other species are ground dwellers found in different parts of the world. [6] The pelicans usually construct the nest in large tree species like Banyan tree, tamarind tree, peepal tree, albizia tree and other locally available common species during active periods i.e. November.



Fig: 6 BANYAN TREE

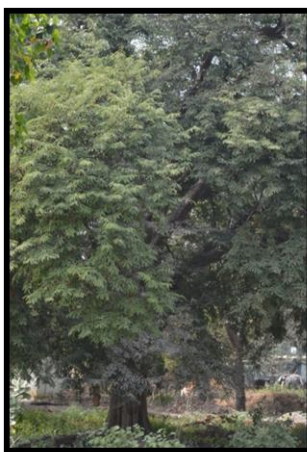


Fig: 7 TAMARIND TREE



Fig: 8 SPOTTED BILLED PELICAN

The foraging behaviour of pelicans is explained as follows. It usually feed on only fishes like *common shiner*, *tilapia*, *rohu*, *catla* and other common varieties. [7] It usually feeds 1.5 to 2 kg intake of fish particularly *Rohu* or *Catla*. It has long beak specialized with large pouch which helps in taking in of food along with water which is pushed inside to the digestive system.



Fig: 9 PELICAN POUCH



Fig: 10 TILAPIA



Fig: 11 ROHU



Fig: 12 CATLA

The adult pelican feeds its young ones thorough its long beak with fish inside it and passes the entire food material to the beak of young ones. [8] Pelicans require 1 hour for to complete enter into the digestive system; then the process the digestion begins. Since they have well developed digestive system it can complete digest the food particles. It takes around 6 hours to complete the process of digestion. [9] The process of complete intake of food particles can be illustrated by the following diagram;

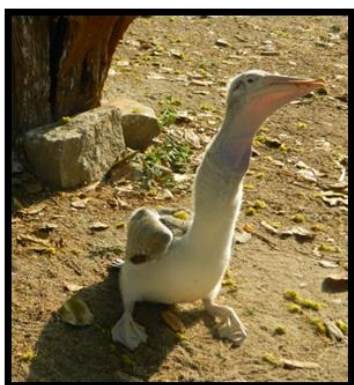


Fig: 13. Intake of food



Fig: 14. Intake of food



Fig: 15. Intake of food

In addition to foraging behaviour pellet analysis was done by collecting the pellets. [10] This shows that pellets contain nitrogenous wastes urea which is indicated by whitish powdery

material. [11] The presence of potassium and phosphate shows that it is one of the best biological manure. It even contains proteinaceous substance which is present in the food in the form of fish.



Fig: 16. Linge Gowda with research scholar



Fig: 17. Linge Gowda



Fig: 18. Linge Gowda with research assistant Ramesha

Finally physicochemical water analysis was done which shows PH value is 8.59, turbidity is 32.9, nitrate 0.1, total suspended solids 59.0, nitrate 6.2, fluoride 0.6, COD 116, BOD 18, dissolved oxygen 5.1, residual free chlorine 0.1, & total phosphate 1.7. All these values indicate water is fit for consumption for pelican and other living organisms. Other parameters were also analysed and conclude that all the observed values were within the normal values. [12] Hence we can conclude that it holds good and hence these tanks are to be preserved for conserving the pelicans and other living organisms.

CONCLUSION AND RECOMMENDATIONS

Since, more than 500 years the village of **Kokkare Bellur** has been shared by birds and human beings living in Symbiosis. The tall trees of the village (*Ficus religiosa*, *Ficus bengalensis*, *Tamarindus indica*, *Acacia nilotica*, *Thespecia populenea*.) have provided a safe have for spot-billed pelicans to build their nests to carryout foraging behaviour. [13] In turn, the fish diet of the breeding birds has repaid the villagers with a potassium and phosphate rich source of manure for their crops, but now this age old pattern of harmony between the avian visitors and their human hosts has been rudely shattered and the very existence of the pelicans is in jeopardy.

The spot billed pelican (*Pelicans philippensis*) is a globally threatened species that has suffered a rapid decline in population during that past seventy years. [14] At present the local forest authorities offer token compensation to villagers whose trees are used by birds for nesting. The sum given does not cover even half the value of crop loss *eg.* in case of tamarind. To overcome these problems, a management strategy in partnership with the villagers should evolve to ensure that **Kokkare Bellur** remains a safe haven for the pelicans. [15]

- Running of a Pen: for saving pelican chicks that have fallen off the nests
- An Enclosure was made with iron poles and mesh to protect young orphan chicks from stray dogs.
- A number of perches and a small pond were prepared inside the enclosure.
- Fish is fed to the pelicans 3 times a day.
- Quantity of fish consumed each day is recorded.
- Growth of pelicans is recorded by measuring their weights, beak length, wing span and legs regularly. Juvenile birds are induced to fly by carrying them on one's arm.
- Hand feeding is gradually reduced and the birds are made to pick fish from the pond.
- All persons involved (including children) are educated about spot billed pelicans
- All birds are ringed with color bands before they are reintroduced into the wild.
- Integrating conservation in this micro-site with the larger landscape on which the birds depend, and where ecologically destructive activities are taking place.
- Rising unemployment in the village, economic aspiration of the younger generation which differs from their elders and the lack of innovation income generation schemes which can absorb these youth.

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