

## Aquatic and Semi Aquatic Birds, Threats and Conservation of Bird Fauna of Ballaleshwar Lake, Panvel. Dist. Raigad (Maharashtra)

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**Abstract:** The birds are the biological indicator in aquatic environment. Birds have played a unique role in the growth, protection and restoration of natural environment. Aquatic and semiaquatic birds are biological indicator in aquatic environment because the birds belong to the top level of food chain in aquatic ecosystem. Ecological change caused changing number of breeding and wintering of aquatic and semi aquatic bird's population. Many natural habitats in the study area are undergoing changes as a result of human activities. Under this correlation many species are declining precipitously. To conserve birds and their natural habitats there is need to understand their life cycles, habitats in which they live. The drainage of marshes for land reclamation and the pollution of lakes from effluent discharge have affected the water bodies thus deteriorating the environment. The aquatic vegetation includes mainly the species of *Ehorniadiversifolia*, *Pistiastratiotes*, *Typhaangustifolia* and *Ricinuscommunis*. The study was carried out monthly at Ballaleshwar lake show the existence of aquatic birds like Indian Purple Moorhen (*Porphyrioporphyrus*), Common moorhen- *Gallinulachloropus*, Dusky moorhen – *Gallinulatenebrosa*, Immature moorhen- *GallinulaChloropus*, Waterhen- White breasted-*Amauronisphoenicurus*, Little Cormorant- *phalacrocoraxnigar*, Great Cormorant- *phalacrocoraxcarbo* and semi-aquatic birds like, Pied Kingfisher- *Cerylerudis*, White throated kingfisher- *Halcyon smyrnensis*, Pond heron (*Ardeolagravii*), Dabchick (*Tachybaptusruficollis*), Cattle egret (*bubulcus ibis*) etc.

**Key words:** Aquatic birds, Ballehwar Lake, Panvel, Semi-aquatic birds, conservation.

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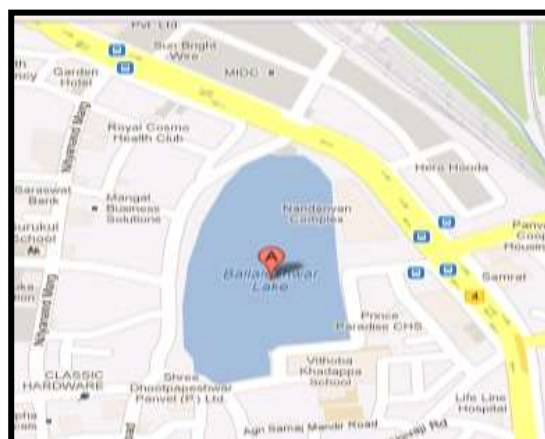
### I. Introduction

Lakes serve as an important life support system by helping in recharging of aquifers and regulating hydrological regimes. The lake produces excellent feeding and resting habitat for some aquatic and semi aquatic birds. Aquatic and semiaquatic birds as a group are suited to feed and breed in environments in which water forms fundamental part. Aquatic and semi aquatic birds are biological indicators in aquatic environment because these birds belong to the top level of food chain in aquatic ecosystem. Ecological changes caused changing number of breeding and wintering of aquatic and semiaquatic bird's populations. Bird's populations are a sensitive indicator of pollution in terrestrial as well as in aquatic ecosystem (Gaston, 1974). India and its neighborhood countries now play host to migratory birds. Bird's habitat within the lake area seems to be strongly influenced by climatic changes and immediate human impact. Many natural habitats in the study area are undergoing changes as a result of human activities. Under this condition the numbers of many species are declining precipitously. To conserve birds and their natural habitats there is need to understand their life cycles, habitats in which they live. The drainage of marshes for land reclamation and the pollution of lakes from effluent discharges have affected the water bodies through deteriorating the environment. When consequent environmental changes exceed the tolerance limits of species, habitat change also becomes an ultimate cause for long term changes in bird distribution. The aquatic vegetation includes mainly the species of *Ehorniadiversifolia*, *Pistiastratiotes*, *Typhaangustifolia* and *Ricinuscommunis*.

The major threat affecting bird populations is the unrestricted habitat loss and degradation of aquatic surrounding due to human activities more than half of the wet lands, estuaries, mangroves and marsh lands across of breadth of the Western Ghats has been destroyed. Wet lands in and around cities and towns are drained and raised with soil to accommodate concrete jungles. The density and diversity of water birds are influenced by rainfall, temperature humidity and cloudiness (Briggs & Holmes, 1988; Custur & Osborne, 1985). Rainfall has great influence on the bird population (Baylis, 1989). Bird communities can be useful indicators of ecosystem structure since they depend on lower trophic levels for their current activities (feeding, nesting, resting) and population success. In addition birds can play an important role in the nutrient cycles of many aquatic ecosystems. An integral view of the functioning of aquatic ecosystem requires the incorporation of as many

trophic levels as possible. (Cohen et al. 1990). Ecological values of aquatic and semi aquatic birds in aquatic ecosystems in natural environment emphasizes to identification and investigation of these birds.

## II. Study Area



Panvel is situated on the banks of the Gadhi River. Panvel is by far the largest and most popular city in Raigad district. Panvel is surrounded by some major MIDC managed regions. It is fast developing and the most populated city of Raigad district which falls under Navi Mumbai area. Panvel is centrally located with all required facilities and industrial area (Taloja MIDC, Patalganga MIDC, Kamothe Industrial Area, Uran Port area, Khopoli etc). Ballaleshwar Lake is placed at west north of Panvel. Its surface area is 1 sq. Km with a mean depth of approximately 4 m and the average annual water temperature is 17 to 27°C with salinity ranging between 3 to 4 ppm. The Lake provides excellent feeding and roosting habitat for several aquatic and semi-aquatic birds.

## III. Material And Method

Study was carried out monthly for one year in Ballaleshwar Lake and identification of aquatic and semi-aquatic birds has been carried out by using binoculars and a telescope. Some species of birds have also been shot. The birds were identified according to Evans (1994), Harris et al. (1991) and K. Hudec (1990). The study on bird habitats was carried out by regular visits to the lake in the morning between 6.30 to 9.30 a.m.

## IV. Results And Discussion

The Indian subcontinent represents 2094 forms belonging to 1200 species of avifauna. Ali and Ripley (1983), Ripley (1982). This abundance and diversity of avian community obviously indicate the high ecological diversity of the country. The study was carried out monthly at Ballaleshwar Lake, showing the existence of aquatic birds like Indian Purple Moorhen (*Porphyrioporphyrus*), Common Moorhen - *Gallinula chloropus*, Dusky Moorhen - *Gallinula tenebrosa*, Immature Moorhen - *Gallinula chloropus*, Waterhen - *White breasted Amaurornis phoenicurus*, Little Cormorant - *Phalacrocorax niger*, Great Cormorant - *Phalacrocorax carbo* and semi-aquatic birds like, Pied Kingfisher - *Ceryle rudis*, White-throated Kingfisher - *Halcyon smyrnensis*, Pond heron (*Ardeola grayii*), Dabchick (*Tachybaptus ruficollis*), Cattle Egret (*Bubulcus ibis*) etc.

### Indian Purple Moorhen: (*Porphyrioporphyrus*)



This bird has very beautiful purplish blue plumage with long red legs, oversized toes and a distinctive thick red beak. The bald red forehead or frontal shield with a white patch under the stumpy tail, conspicuous when flicked up at each step are leading clues to its identity. The bird rarely swims. Its food consists of seeds, tubers, rice, mollusks, frogs and vegetable matter. The nest is a large pad of interwoven rushes or paddy leaves placed on matted water plants within flooded reed beds. The normal clutch consists of 3 to 7 eggs, creamy to reddish buff in color, blotched and spotted with reddish brown.

**Purple Moorhen (*Porphyrioporphyrus*)**

The Purple Swamphen (*Porphyrioporphyrus*), also known as the African Purple Swamphen, Purple Moorhen, Purple Gallinule, Pūkeko or Purple Coot is a large bird in the family Rallidae. The species has a very loud explosive call described as a "raucous high-pitched screech, with a subdued musical tuk-tuk". It is particularly noisy during the breeding season. Despite being clumsy in flight it can fly long distances, and it is a good swimmer, especially for a bird without webbed feet. The Purple Swamphens are generally seasonal breeders, but the season varies across their large range, correlating with peak rainfall in many places, or summer in more temperate climes. The Purple Swamphen breeds in warm reed beds.

**White-breasted Waterhen (*Amaurornisphoenicurus*)**



The **White-breasted Waterhen** (*Amaurornisphoenicurus*) is a waterbird of the rail and crane family Rallidae that is widely distributed across Southeast Asia and the Indian Subcontinent. They are dark slaty birds with a clean white face, breast and belly. They are somewhat bolder than most other rails and are often seen stepping slowly with their tail cocked upright in open marshes or even drains near busy roads. They are largely crepuscular in activity and during the breeding season, just after the first rains, make loud and repetitive croaking calls. Adult White-breasted water hens have mainly dark grey upperparts and flanks, and a white face, neck and breast. The lower belly and undertail are cinnamon colored. The body is flattened laterally to allow easier passage through the reeds or undergrowth. They have long toes, a short tail and a yellow bill and legs. Sexes are similar but females measure slightly smaller. Immature birds are much duller versions of the adults. The downy chicks are black, as with all rails.

**Dusky Moorhen (*Gallinulatenebrosa*)**





The adult Dusky Moorhen is mainly dark grey-black, with a browner tinge to the upper parts. It has a red frontal shield and yellow-tipped red bill like its Eurasian relative, but lacks the white flank line shown by Common Moorhen, and has orange-yellow rather than yellow legs. Sexes are similar, but young birds have mid-brown plumage. This is a noisy species with a loud *kruk* call. Dusky Moorhen is found in wetland habitats, with a preference for freshwater marshes. It will forage on rubbish tips, and is generally omnivorous, taking a wide variety of plant and animal food. This species builds a bulky nest at the water's edge, and lays 5-18 whitish eggs. It is territorial when breeding, but otherwise gregarious.

**Common Moorhen (*Gallinulachloropus*)**



The Common Moorhen is a widely spread bird, found on every continent except Australia and Antarctica. Prefer freshwater marshes with some open water. They are often found with their close relative, the *American Coot*, but are usually more shy and retiring. They are generally just casual migrants and visitors to the state. Uses a variety of methods for foraging. Will swim on the water's surface, dabbling at the surface, dipping its head below the water, or sometimes by diving beneath the surface. They also will feed on land, or climb through wetland vegetation in search of food. Breeding generally a non-breeder in South Dakota, although there are scattered records of confirmed breeding. Similar Species *American Coot*, *Purple Gallinule*

**Cattle Egret (*Bubulcus ibis*)**



The bird is white in color and very similar to the little egret, but can always be distinguished from it in the non breeding season by its stouter yellow bill. It is often found sitting on grazing cattle. The food consists of insects. They breed in colonies in the company of pond herons, cormorants and white egrets. The female lays a clutch of 3 to 5 eggs and the nest is made up of dry twigs.



**White-throated Kingfisher (*Halcyon smyrnensis*)**

The bird is pretty small with beautifully colored feathers and a white breast. The bill is pointed, strong and useful in catching fish, tadpoles and insects. The kingfisher digs a long tunnel into the bank of a stream to make its nest. The tunnel widens out at the end to form a chamber, and the mother bird goes into this and lays five to seven glossy white eggs. The nesting season is between March and June. During the breeding season they call loudly in the mornings from prominent perches including the tops of buildings in urban areas or on wires. This is a large kingfisher, 28 cm in length. The adult has a bright blue back, wings and tail. Its head, shoulders, flanks and lower belly are chestnut, and the throat and breast are white. The large bill and legs are bright red. The flight of the White-throated Kingfisher is rapid and direct, the short rounded wings whirring. In flight, large white patches are visible on the blue and black wings. Sexes are similar, but juveniles are a duller version of the adult.

**Pied Kingfisher (*Cerylerudis*)**



This kingfisher is about 17 cm long and is white with a black mask, a white supercilium and black breast bands. The crest is neat and the upperparts are barred in black. Several subspecies are recognized within the broad distribution. The Pied Kingfisher is estimated to be the world's third most common kingfisher, and being a noisy bird, hard to miss. This kingfisher feeds mainly on fish, although it will take crustaceans and large aquatic insects such as dragonfly larvae. The breeding season is February to April. Its nest is a hole excavated in a vertical mud bank about five feet above water. The nest tunnel is 4 to 5 feet deep and ends in a chamber. Several birds may nest in the same vicinity. The usual clutch is 3-6 white eggs. The pied kingfisher sometimes reproduces co-operatively, with young non-breeding birds from an earlier brood assisting parent or even unrelated older birds. In India, nestings have been found to be prone to maggot infestations.

**Pied Myna (*Sturnus contra*)**



The Pied Myna or Asian Pied Starling (*Sturnus contra*) is a species of starling found in the Indian Subcontinent and Southeast Asia. They are usually found in small groups mainly on the plains and low foothills. They are often seen within cities and villages although they are not as bold as the Common Myna. They produce a range of calls made up of liquid notes. Several slight plumage variations exist in the populations and about five subspecies are named. This myna is strikingly marked in black and white and has a yellowish bill with a reddish bill base. The bare skin around the eye is reddish. The upper body, throat and breast are black while the cheek, lores, wing coverts and rump are contrastingly white. The sexes are similar in plumage but young birds have dark brown in place of black. The subspecies vary slightly in plumage, extent of streaking of the feathers and in measurements.

**Common Myna (*Acridotherestrictis*)**



The Common Myna is readily identified by the brown body, black hooded head and the bare yellow patch behind the eye. The bill and legs are bright yellow. There is a white patch on the outer primaries and the wing lining on the underside is white. The sexes are similar and birds are usually seen in pairs. The Common Myna obeys Gloger's rule in that the birds from northwest India tend to be paler than their darker counterparts in South India.

**Little Cormorant (*Microcarboniger*)**



The **Little Cormorant** (*Microcarboniger*) is a member of the Cormorant family of seabirds. Slightly smaller than the Indian Cormorant it lacks a peaked head and has a shorter beak. It is found widely distributed across the Indian Subcontinent and extending east to Java where it is sometimes called the Javanese Cormorant. It forages singly or sometimes in loose groups in lowland freshwater bodies including small ponds, large lakes, streams and sometimes coastal estuaries. Like other cormorants, they are often found perched on a waterside rock with their wings spread out after coming out of the water. The entire body is black in the breeding season but the plumage is brownish and the throat has a small whitish patch in the non-breeding season. They breed gregariously in trees, often joining other water birds at heronries.

**Indian Cormorant(*Phalacrocoraxfuscicollis*)**



The Indian Cormorant or Indian Shag (*Phalacrocoraxfuscicollis*) is a member of the cormorant family. It is found mainly along the inland waters of the Indian Subcontinent but extending west to Sind and east to Thailand and Cambodia. It is a gregarious species that can be easily distinguished from the similar sized Little Cormorant by its blue eye, small head small head with a sloping forehead and a long narrow bill ending in a hooked tip.

**Threats to Birds:**

The major threat affecting bird population is the unrestricted habitat loss and degradation of aquatic surrounding due to human activities. Wetlands in and around cities and towns are drained and raised with soil to accommodate concrete jungles. The loss and degradation of habitat is the greatest threat to the long term survival of water birds. Irreversible loss of wetland continues at an alarming rate (Finlayson and Rea, 1999). Shrinkage

of water surface, decrease in salinity and fishery resources, prolific growth of invasive fresh water aquatic weeds is the greatest threats to the lake. An overall loss of biodiversity with decline in productivity adversely affecting the livelihood of the community.

#### **Conservation Strategies:**

The preservation of wet lands is crucial for the survival of both resident and migratory birds because they provide the birds with specialized microhabitats and different kinds of food sources. The lake area should be protected by fencing. The areas of regular fishery should be fixed. The aquatic weeds must be controlled. Human exploitation should be stopped. Boating should also be avoided in the lake. More islands should be provided for the birds to rest and feed. Planting of trees to attract roosting of birds should be encouraged and inlet of domestic sewage should be strictly prohibited. Protection of bird habitat and bird species, economic incentives to the local population to stop poaching of birds and also required education and environmental awareness activities for the fisher folk to execute multidisciplinary development activities either itself or through the other agencies. To protect lake ecosystem with all its genetic diversity, concern action to be initiated by Panvel Municipal Corporation to adoptive conservation and management actions.

#### **V. Conclusion**

The preservation of wetlands is crucial for the survival of both resident and migratory birds because they provide the birds with specialized microhabitats and different kinds of food sources. Loss of wetlands and introduction of new age chemicals in agriculture is threatening the life support system because of large scale habitat destruction. Bird conservation practices like presentation or reduction in habitat loss, habitat deterioration and habitat fragmentation need to focus on the small details like shielding bird nests, protecting migratory neighborhoods and providing an eco-friendly environment in order to better appreciate the large spectrum of life. Since birds cross oceans and continents, they belong to all of humanity. It is in our power to protect and nurture some of these extraordinary life forms. We need to walk through this world and leave an eco-friendly foot print which protects the interest of both, man and bird.

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