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# To Study The Bird Diversity And Suggestion For An Ecological Park Plan of Gandhari Birding Area As A Urban-Restoration Project

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**Abstract:-**

*Ever increasing population is not only threat to environment but also lead to alteration in beauty of nature. With rampant concretization, transport and human interference for their livelihood in an around the eco sensitive zone is steadily losing green cover and posing threat to biodiversity.This area is home for many bird species- residential as well as winter visitors. Gandhari river area also has significant diversity of insects, butterflies. The above area is famous recognized spot for birding but during the recent survey it was observed that the diversity of winter birds is less as compare to earlier may be because of more human interference. This study aims to propose to develop an area as an ecological park in the growing urban sprawls of Kalyan - Dombivli with the help of effective management and conservation strategies. Study also covered a background study of bird survey from the gandhari region.*

***Keywords:*** *Biodiversity, Gandhari River, urbanization, birds in Kalyan*

## Introduction

Birds are the indicator of the health of an ecosystem as they indicate its needs and diversity. Birds play various useful roles such as control of insects, pests of agricultural crops, predator of rodents, scavengers, seed dispersers and as pollinating agents. Birds provide ecological services that contribute to maintaining ecosystem processes and some of the necessary conditions on which human other organisms depend. This services ranges from food provisioning to modification of habitat and resources flows in biological communities.

To study any ecosystem the birds serve as important component as they have ability to fly away and avoid any obnoxious conditions. Hence, they are considered as important health indicators of the ecological conditions and productivity of an ecosystem (Newton, 1995; Desai and Shanbag, 2007). Wetlands are important habitats for birds. Birds also play an important role in wetland ecosystem. They use wetlands for breeding, nesting and teaching young, as source of drinking water, for feeding, shelter and for social interaction. Wetlands provide food for birds in the form of plants, algae, vertebrates and invertebrates which provide the nutrients. Birds have daily and seasonal dependence on wetlands for food and other life supporting systems (Stewart, 2001). Many winter migratory birds therefore choose wetlands as their habitats. India with huge wetland area therefore is a preferred place for migratory birds.

The Gandhari river started indicating degradation in the recent era due to anthropogenic activities like religious rituals, construction activities, disposal of sewage. Therefore the present survey was conducted to prepare a checklist of birds occurring in Gandhari River, Kalyan as a baseline data and suggest for development of ecological park.

## Study Area

The selected study area for the above research is famous as Gandhari birding area. The river water meets the kalyan creek forming a wetland belt. The bridge passes over the water body is located on the western outskirts of the kalyan city and built over river ulhas. The bridge connects kalyan city to the

gandhari village. It is the only passage which connects kalyan to the Mumbai agra national highway (NH3). The nearby area is known for its scenic beauty, fresh open air, flying birds and coolness in the early morning is making favorite jogging spot for kalyan residents.

The water body is lined by vegetation. The open land along the river shows patches of open scrubland, forest, agriculture and small ponds inside. Due to this variety of habitats large numbers of birds areinhabited. The main wetland water attracts migratory birds in winter season due to availability of plenty of food.

Due to the over-crowding in the kalyan city nowadays the megaprojects in the real estate industry are developing in the city outskirt areas. One of the upcoming areas is gandhari region. The area is giving a cityscape for tall construction around. Well known real estate company had established their projects near study area in past few years. Few of them are Godrej hill complex, vasant valley, wadhwa height, oshodhara residency, riverdale, lodhapark,ritu world, lifestyle city. The river water also carries pollutant streams which are released from nearby MIDC. As it connects kalyan to national highway ever increasing load of heavy duty transportation is also a common scene.

**Material and Methods**

The study has been carried out by frequent survey, twice a month to the area. The area was surveyed for four months from October to January in winter season in 2011-12 and 2012-13. Identification of the bird species were done by referring field guides "Birds of the Indian Subcontinent" by Richard Grimmett and "The book of Indian Birds" by Salim Ali. For identification the binocular (Olympus and celestron) and the digital camera (Canon SX 130) was used.

**Observations**

**A table showing list of bird species recorded from the study area**

| Sr. No. | Family | Common Name | Scientific Name | Category | Status |
|---|---|---|---|---|---|
| **1.** | Accipitridae | Brahminy Kite | *Haliasterindus* | R | C |
| **2.** | | Black shoulder Kite | *Elanuscaeruleus* | R | C |
| **3.** | Ardeidae | Little Egret | *Egrettagarzetta* | R | C |
| **4.** | | Indian Pond-Heron | *Ardeolagrayii* | R | C |
| **5.** | | Purple Heron | *Ardeapurpurea* | R | UC |
| **6.** | | Grey heron | *Ardeasineria* | M | UC |
| **7.** | | Cattle Egret | *Bubulcus ibis* | R | C |
| **9.** | Charadridae | Red-wattled Lapwing | *Vanellusindicus* | R | C |
| **10.** | | Little Ringed Plover | *Charadriusdubus* | R | C |
| **11.** | Psittacidae | Rose ringed Parakeet | *Psittaculakrameri* | R | C |
| **12.** | | Alexenderine Parakeet | *Psittaculaeupatria* | R | C |
| **13.** | Megalaimidae | Coppersmith Barbet | *Megalaimaharmacephala* | R | C |
| **14.** | Picidae | Yellow-crowned woodpecker | *Dendrocoposmahrattensis* | LM | UC |
| **15.** | Oriolidae | Indian Golden Oriole | *Orioluskundoo* | R | C |
| **16.** | Bucerotidae | Indian Grey Hornbill | *Ocycerosbirostris* | R | C |
| **17.** | Upupidae | Common Hoopoe | *Upupaepops* | R | UC |
| **18.** | Alcedoatthis | Common Kingfisher | *Alcedoatthis* | R | C |
| **19.** | | White Throated Kingfisher | *Halcyon smyrnensis* | R | C |
| **20.** | Meropidae | Green Bee eater | *Meropsorientalis* | R | C |
| **21.** | Cuculidae | Pied Cuckoo | *ClamatorJacobinus* | M | UC |
| **22.** | | Indian Cuckoo | *Cuculusmicropterus* | R | C |

| | | | | | |
|---|---|---|---|---|---|
| **23.** | | Greater Coucal | *Centropus* | R | C |
| **24.** | Culumbidae | Rock Pigeon | *Columbia livia* | R | C |
| **25.** | | Spotted Dove | *Streptopeliachinensis* | R | C |
| **26.** | | Laughing Dove | *Streptopeliasenegalensis* | R | C |
| **27.** | | Yellow footed green pigeon | *Treronphoenicoptera* | R | UC |
| **28.** | Scolopacidae | Common sandpiper | *Actitishypoleucos* | M | UC |
| **29** | | Marsh sandpiper | *Tringastagnatilis* | M | C |
| **30** | | Wood sandpiper | *Tringaglareola* | M | C |
| **31** | | Green sandpiper | *Tringaocropus* | M | UC |
| **30.** | Recurvirostridae | Black winged stilt | *Himantopushimantopus* | R | C |
| **31.** | Phalacrocoracidae | Little Cormorant | *Phalacrocoraxniger* | R | C |
| **32.** | | Indian cormorant | *Phalacrocoraxfuscicollis* | R | C |
| **33.** | Ciconidae | Asian openbill stork | *Anastomusoscitans* | R | C |
| **34.** | Lanidae | Long tail shrike | *Laniusschah* | R | C |
| **35.** | Corvidae | House crow | *Corvussplendens* | R | C |
| **36.** | | Large billed crow | *Corvusmacrorhynchos* | R | UC |
| **37.** | Rhipiduridae | White browed fantail | *Rhipiduraaureola* | R | C |
| **38.** | Dicruridae | Ashy Drongo | *Dicrurusleucophaeus* | R | C |
| **39.** | Aegithinidae | Common iora | *Aegithinatiphia* | R | UC |
| **40.** | Muscicapidae | Oriental magpie robin | *Copsychussaularis* | R | C |
| **41.** | | Indian robin | *Saxicoloidesfulicata* | R | C |
| **42.** | | Common stonechat | *Saxicolatorquata* | LM | C |
| **43.** | | Pied bushchat | *Saxicolacarpata* | R | C |
| | Sturnidae | Asian pied starling | *Sturnus contra* | M | C |
| **44.** | | Rosy starling | *Sturnusroseus* | M | UC |
| **45.** | | Common myna | *Acridotherestristis* | R | C |
| **46.** | Hirundinidae | Wired tail swallow | *Hirundosmithii* | R | C |
| **47.** | | Barn Swallow | *Hirundorustica* | M | C |
| **48.** | Pycnonotidae | Red whiskered bulbul | *Pycononotusjacosus* | R | C |
| **49.** | | Red vented bulbul | *Pycononotuscafer* | R | C |
| **50.** | Cisticolidae | Jungle prinia | *Priniasylvatica* | LM | UC |
| **51.** | | Ashy prinia | *Priniasocialis* | R | C |
| **52.** | | Common tailorbird | *Orthotomussutorius* | R | C |
| **53.** | Leiothrichidae | Jungle babbler | *Turdoidesstriatus* | R | UC |
| **54.** | Alacedidae | Indain bush lark | *Mirafraerytroptera* | R | C |
| **55.** | | Malbar Crested lark | *Ammonesphoenicurus* | R | C |
| **56.** | Nectariniidae | Purple rumped sunbird | *Nactariniazeylonica* | R | C |
| **57.** | Passeridae | House sparrow | *Passer domesticus* | R | C |
| **58.** | Motacillidae | White browed wagtail | *Motacilla* | WM | C |
| **59.** | | Citrine wagtail | *Motacilla* | WM | UC |
| **60.** | | White wagtail | *Motacilla alba* | WM | UC |
| **61.** | | Yellow wagtail | *Motacillaflava* | WM | UC |
| **62.** | | Paddy field pipit | *Anthusrufulus* | R | C |
| **63.** | Estrildidae | Red avadavat | *Amandavaamandava* | R | UC |
| **64.** | Passeridae | Scaly brestedmunia | *Lonchurapuntulata* | R | C |

| | | | | | |
|---|---|---|---|---|---|
| **65.** | | Black headed munia | *Lonchuramalacca* | R | UC |
| **66.** | Anatidae | Spot billed duck | *Anaspoecilorhyncha* | R | C |
| **67.** | Monarchidae | Asian paradise flycatcher | *Terpsiphone paradise* | M | UC |
| **68.** | Monarchidae | Black naped monarch | *Hypothymisazurea* | R | C |
| **69.** | Anatidae | Northern Shoveler | *Anasclypeata* | M | UC |
| **70.** | | Northern pintail | *Anasacuta* | M | UC |
| **71.** | | Common teal | *Anascrecca* | M | UC |
| **72.** | | Garganey | *Anasqurquedula* | M | UC |
| **73.** | | Cotton pygmy goose | *nettapuscoromandelianus* | R | UC |
| **74.** | Accipitridae | Marsh harrier | *Circus aeruginosus* | M | UC |
| **75.** | Pandionidae | Osprey | *Pandionhaliatus* | M | UC |
| | | | | | |

**Table 1: Table showing list of birds observed during study period**

**A study on comparison of occurrence of selected species observed during study period.**

| Sr. No. | Family | Common Name | Scientific Name | Category | 2011 - 12 | 2012 - 13 | 2013 - 14 |
|---|---|---|---|---|---|---|---|
| **1** | Cisticolidae | Jungle prinia | *Priniasylvatica* | LM | Yes | No | No |
| **2** | Scolopacidae | Common sandpiper | *Actitishypoleucos* | M | No | Yes | Yes but rare |
| **3** | | Marsh sandpiper | *Tringastagnatilis* | M | Yes | Yes | No |
| **4** | | Wood sandpiper | *Tringaglareola* | M | Yes | Yes | No |
| **5** | | Green sandpiper | *Tringaocropus* | M | No | Yes | No |
| **6** | | White wagtail | *Motacilla alba* | WM | Yes | No | No |
| **7** | | Yellow wagtail | *Motacillaflava* | WM | No | Yes | No |
| **8** | Anatidae | Northern Shoveler | *Anasclypeata* | M | Yes | Yes | No |
| **9** | | Northern pintail | *Anasacuta* | M | Yes | Yes | No |
| **10** | | Common teal | *Anascrecca* | M | No | Yes | No |
| **11** | | Garganey | *Anasqurquedula* | M | No | Yes | No |
| **12** | | Cotton pygmy goose | *nettapuscoromandelianus* | R | No | Yes | No |
| **13** | Accipitridae | Marsh harrier | *Circus aeruginosus* | M | No | Yes | No |
| **14** | Recurvirostridae | Black winged stilt | *Himantopushimantopus* | R | No | Yes | No |
| **15** | Ciconidae | Asian openbill stork | *Anastomusoscitans* | R | Yes | Yes | Yes but rare |
| **16** | Pandionidae | Osprey | *Pandionhaliatus* | M | Yes | Yes | No |
| **17** | Cuculidae | Pied Cuckoo | *ClamatorJacobinus* | M | No | Yes | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **18** | Monarchidae | Asian paradise flycatcher | *Terpsiphone paradise* | M | Yes | Yes | Yes but rare |
| **19** | Ardidae | Grey heron | *Ardeasineria* | M | Yes | Yes | No |

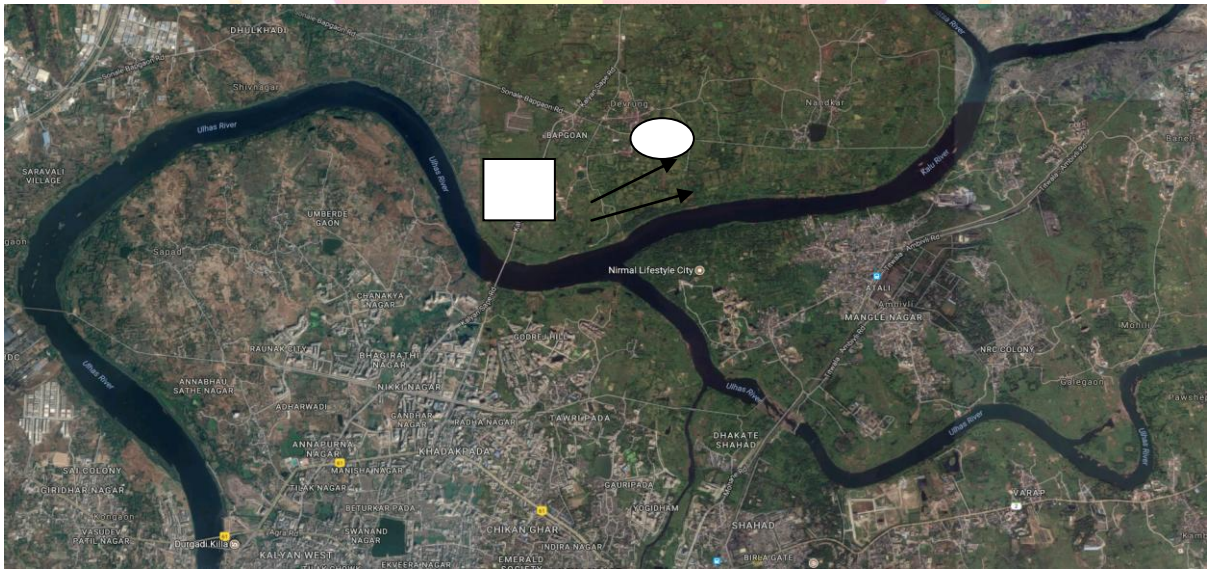
**Table 2: Table showing comparison of bird species observed during 2011 to 2014.**

From the above table it is observed that the bird biodiversity to the study area has reduced qualitatively and quantitatively. Many birds which were recorded in 2012 are lacking in 2013-14. Also the number of migratory visitors has markedly reduced to the area.

The above study suggest that the area requires a conservation to maintain the biodiversity in the area. For which development of an ecological park is a sustainable path towards eco restoration of Gandhari creek as shown in the image.

**Suggestions for development of eco restoration:**

- Removal of accumulated sludge from industrial pollution in river
- Removal of debris laid into the waterbody from nearby residential activities.
- Preparation of land use maps to understand the land utility.
- diversion of sewage discharge into the waterbody.
- Create mounds on the creek area out f excavated material which can be recycled for construction.
- create sound barriers over the bridge to avoid traffic noise
- Recreating plantation in the area of wetland species, herbs, shrubs and trees on borderline.
- Develop interactive learning centre with audio visual display for clear understanding.
- Develop activities like quiz, workshops, celebration of days can help in enhancing the actual participation of youth
- Developing environmental educational activities like field trips, butterfly trail, bird watching etc
- Further rainwater harvesting, waste water treatment, solar technology, vermicomposting, animal raring, nursery development can also create economic revenue for the centre and locals.



**Conclusion**

The present study shows that the Gandhari river and surrounding area harbours rich bird diversity. Gandhari river area, though an aviary for a substantial number of resident and migratory birds, is facing threat in the form of releasing domestic sewage and industrial effluent, concretization and urbanization.

During the survey it was observed that the area of scrubland along the river was burnt and concrete road was constructed by the villagers to carry out their livelihood activities. Also from forest patch villagers collect products like wood for their day to day activities. Apart from this, there are small ponds in the area. Birds use these ponds for their feeding, breeding, resting and nesting activities. During the survey it was noticed that from above ponds villagers are pumping water by diesel engine for construction activities. It creates pollution effects on air, water and noise.

Due to the above activity the local as well as migratory birds might have diverted their ways and therefore less number of species was recorded.

Hence there is need for developing an ecological park as part of conservation practice and urban restoration.

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**Bird images from Gandhari**