



## Avian Distribution of Maval Tehsil on the Basis of their Family and Habitat

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### Abstract:

Birds are an essential component of ecosystems and play a vital role in maintaining ecological balance. The present study focuses on the avian distribution of Maval Tehsil on the basis of their family and habitat, highlighting patterns of occurrence in different ecological zones. Maval Tehsil, located in Pune District, Maharashtra, lies within the Sahyadri range of the Western Ghats, a globally recognized biodiversity hotspot. The region exhibits diverse topographical features such as fertile agricultural lands, high-altitude hill ranges, dense forests, grasslands, wetlands, rivers, and other aquatic bodies, which together provide suitable habitats for a wide range of bird families. The survey provides detailed documentation of bird species along with their family-wise classification and habitat preferences, including forest birds, wetland birds, grassland species, agricultural landscape birds, and aquatic birds. The varied habitats of Maval support members of several important avian families, reflecting high species richness and ecological adaptability. Species such as the Crested Serpent Eagle (*Accipitridae*) are commonly associated with forested and hilly regions, while the Indian Spot-billed Duck (*Anatidae*) inhabits wetlands and aquatic ecosystems. The Asian Paradise Flycatcher (*Monarchidae*) and Oriental Magpie-Robin (*Muscicapidae*) are frequently observed in forest edges and human-modified landscapes. Open grasslands and agricultural fields support species like the Yellow-wattled Lapwing (*Charadriidae*), whereas the Green Bee-eater (*Meropidae*) is widely distributed in open and semi-arid habitats. Studying birds based on their family and habitat provides valuable insights into ecological specialization, habitat dependency, and environmental health. This approach aids in identifying habitat-specific and threatened bird families, supporting effective conservation planning. The findings also enhance awareness among local communities and birdwatchers, encouraging habitat protection and further avian research in the Western Ghats.

**Keywords:** Avian Distribution, Habitat, Family, Western Ghat, Birdwatchers, Maval Tehsil.

### Introduction:

Birds represent one of the most diverse and ecologically significant groups of vertebrates, playing a crucial role in maintaining the structure and functioning of ecosystems. They contribute to essential ecological processes such as pollination, seed dispersal, pest control, nutrient cycling, and act as bio-indicators of environmental health. The distribution of birds is strongly influenced by habitat characteristics and ecological requirements, and their classification based on family and habitat preference provides valuable insights into biodiversity patterns and ecosystem

stability. Understanding avian distribution at a regional level is therefore essential for biodiversity assessment, conservation planning, and sustainable ecosystem management. Maval Tehsil is located in Pune District of Maharashtra and forms an integral part of the Sahyadri range of the Western Ghats, one of the world's recognized biodiversity hotspots. The region is characterized by diverse topography, including hilly terrains, deep valleys, dense forests, grasslands, agricultural fields, rivers, lakes, and reservoirs. The presence of major water bodies such as Pavana and Andra dams further enhances

habitat diversity. Seasonal variations in rainfall and temperature create favorable conditions for both resident and migratory bird species. Due to its heterogeneous habitats, Maval Tehsil supports rich avian diversity across multiple bird families. Forested areas harbor raptors, flycatchers, and canopy dwellers, while wetlands support waterfowl and wading birds. Agricultural landscapes and grasslands provide feeding grounds for insectivorous and granivorous birds. Migratory species visit the region seasonally, further increasing species richness. Despite this diversity, systematic family-wise and habitat-based documentation of birds in Maval remains limited. Maval Tehsil serves as an important ecological corridor within the Western Ghats, supporting breeding, feeding, and migratory stopover sites for birds. The region's varied habitats allow coexistence of multiple bird families with different ecological requirements. Birds in Maval contribute to ecosystem services such as natural pest control in agricultural fields, pollination, and maintenance of food webs. The area also holds potential for birdwatching and ecotourism, promoting conservation awareness among local communities. Rapid urbanization, agricultural expansion, deforestation, and infrastructure development pose significant threats to bird habitats in the Western Ghats. Changes in land use and habitat fragmentation directly affect bird distribution and family composition. Although Maval Tehsil lies within a biodiversity-rich region, detailed studies focusing on avian distribution based on family and habitat are scarce. The present research aims to fill this knowledge gap by systematically documenting bird species, classifying them according to their families, and analyzing their habitat preferences. This study will provide baseline data essential for long-term monitoring, conservation planning, and sustainable management of avian diversity in Maval Tehsil.

Birds are taxonomically classified into different families based on shared morphological, anatomical, and behavioral characteristics. Each bird family exhibits distinct adaptations related to feeding habits, nesting behavior, flight patterns, and habitat utilization. For instance, the family *Accipitridae* includes birds of prey such as eagles and hawks, adapted for hunting in forested and open landscapes, whereas *Anatidae* comprises ducks and geese adapted to aquatic habitats. Similarly, families such as *Muscicapidae*, *Meropidae*, *Charadriidae*, and *Columbidae* are distributed across forest edges, grasslands, wetlands, and agricultural areas. Studying birds on a family-wise basis helps in understanding evolutionary relationships, ecological specialization, and habitat dependency, which are crucial for identifying vulnerable and habitat-specific bird groups.

Bird habitats are defined by vegetation structure, availability of food resources, water presence, and nesting sites. Different bird families show preferences for specific habitat types, resulting in distinct patterns of distribution.

**Arboreal Habitat:** It supports birds that primarily live, feed, and nest in trees. Forest canopies, tall trees, and wooded areas provide shelter and food for arboreal birds such as flycatchers, barbets, hornbills, and woodpeckers. These birds play a major role in seed dispersal and insect population control.

**Aerial Habitat:** It includes birds that spend a significant portion of their life in flight, feeding on airborne insects or small prey. Swifts, swallows, and bee-eaters are typical aerial birds, adapted with streamlined bodies and strong wings for continuous flight. Such species are commonly observed over open fields, water bodies, and agricultural landscapes.

**Aquatic Habitat:** It comprises rivers, lakes, wetlands, reservoirs, and marshes. Aquatic birds such as ducks, herons, egrets, kingfishers, and

cormorants depend on these habitats for feeding and breeding. These birds serve as indicators of water quality and wetland health.

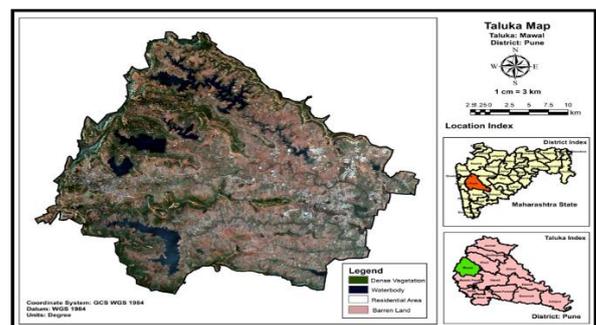
**Ground Habitat:** It includes grasslands, open plains, agricultural fields, and forest floors. Ground-dwelling birds like lapwings, quails, peafowl, and larks rely on open spaces for foraging and nesting. These birds are highly sensitive to land-use changes and habitat disturbance.

**Shrub Habitat:** It consists of bushes, hedges, scrublands, and forest undergrowth. Shrub-dwelling birds such as warblers, babblers, prinias, and bulbuls use dense vegetation for nesting and protection from predators. This habitat supports high species diversity, especially small passerine birds.

#### Material and Methodology:

**Study Area:** Maval tehsil is situated in the Pune district to the west and functions as the connection between Mumbai and Pune. Due to the geological structure of the Sahayadri range, the Maval region is located within the Western Ghat. Maval has a rich cultural and historical heritage, ranging from Shri Santa Tukaram Maharaj to Chatrapati Shivaji Maharaj. Maval's position, temperate climate, scenic beauty, cultural heritage, and accessibility by road and train make it an ideal growth model. Due to the suitability of climate for a wide variety of animals, Maval Tehsil has been blessed with an abundance of biodiversity. Both migratory and local birds can be found here because there is an abundance of water. Maval is well renowned for having a variety of bird species, including rare, migratory, local, endangered, and threatening. I chose this field of study since there hasn't been much research done on bird habitat and variety. Many places in Maval Tehsil, including Andar Maval, Lonavala, Kamshet, Malavali, etc., have deep forests. Additionally, there are many water

bodies are available where migratory birds and aquatic species can be easily observed. Traveling around the entire Maval is quite convenient due to the abundance of transportation options, including national highways, local trains, and bus services. The primary reason this area was selected for the study is that it is ideal for all kinds of birds to stay or move seasonally due to its dense forest, hilly regions, mountains, aquatic sources, open land, etc.



**GIS Image Shows the Study Area of the Maval Tehsil, Dist. Pune, Maharashtra.**

#### Data Collection, Observation and Identification:

Systematic field observation and photographic documentation were used in the current study on bird diversity. High resolution photos were the main method used to document birds because these images allowed for exact identification without interfering with their natural behaviors. Local birds, migratory birds, aquatic birds, residential birds, rare, endangered and threatened species were among the ecological and conservation-based groups into which the recorded species were divided based on field observations. Birds were further categorized based on their dietary patterns, including carnivorous, insectivorous, nectar-insectivorous, and ground-insectivorous species, in addition to this general classification. This multi-level classification made it easier to comprehend the various bird groups' ecological responsibilities in the research area. DSLR cameras like the Canon

1300D and Canon 200D Mark II were used for observation as well as recording the data. Field surveys were carried out between 6:00 AM and 11:00 AM in the morning and between 3:00 PM and 7:00 PM in the evening, when birds are most active. These times of day were chosen because birds are most active in the early morning and late afternoon, which facilitates identification and detection. Since many migratory species only visit the area at certain periods of the year, surveys were carried out seasonally, with a focus on seasonal variations. Because Maval Tehsil has abundant flora and sustainable water sources like rivers, lakes, and dams, data gathering sites were carefully chosen. These areas sustain a variety of bird groups, including migratory and aquatic species. Details of birds that were either directly observed or photographed were recorded in daily field notes. Following data collection, habitat preference and species diversity were taken into consideration while analyzing and classifying the data. After all the data were collected, statistical analysis was done to evaluate trends in habitat utilization, dietary preferences, species richness,

and family-wise distribution. The identification of birds was done under the direction and advice of seasoned ornithologists. To verify species identity and classification, standard reference books written by well-known ornithologists like Salim Ali, Richard Grimmett, Carol Inskipp, and Tim Inskipp were also utilized. During the survey, 321 bird species from 74 distinct families were identified. With 28 species, the Accipitridae family had the most diversity, followed by the Muscicapidae family with 21 species. There were six species in each of several families, including Cisticolidae, Alaudidae, Dicruridae, Estrildidae, Nectariniidae, and Apodidae; Cuculidae had eight species, Hirundinidae five, and Ciconiidae three. There was little diversity within certain families, as evidenced by the presence of just one species. 242 species were found to be arboreal, 29 preferred shrub environments, 26 aquatic, 15 ground dwelling and nine aerial, according to habitat based study. This thorough approach demonstrates how habitat variety has a significant impact on bird richness in the studied area.

#### Data Collection:



*Bubo bubo*



*Athene brama*



*Anas poecilorhyncha*



*Cecropis daurica*



*Pycnonotus jocosus*



*Cinnyris asiaticus*



*Terpsiphone paradise*



*Spilornis cheela*



*Haliastur indus*



*Upupa epops*



*Psittacula cyanocephala*



*Halcyon smyrnensis*



*Monticola cinclorhyncha*



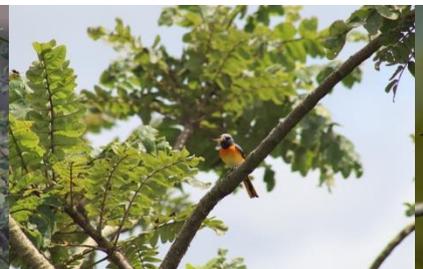
*Cacomantis flabelliformis*



*Ploceus philippinus*



*Sturnia pagodarum*



*Pericrocotus cinnamomeus*



*Aethopyga nipalensis*



*Ardeola grayii*



*Spilopelia senegalensis*



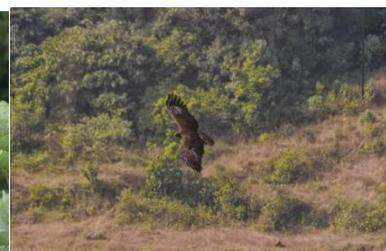
*Streptopelia orientalis*



*Dicrurus macrocercus*



*Merops orientalis*

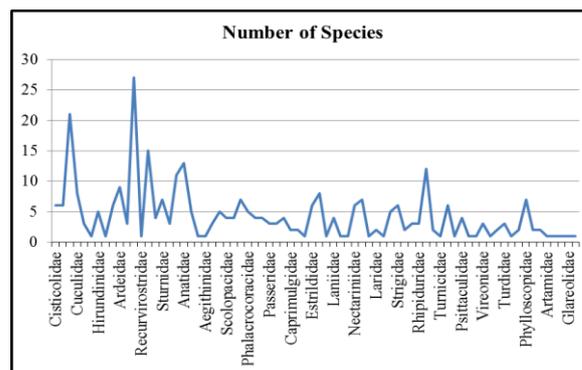


*Ictinaetus malaiensis*

*Milvus migrans**Grammatoptila striata**Alcedo atthis*

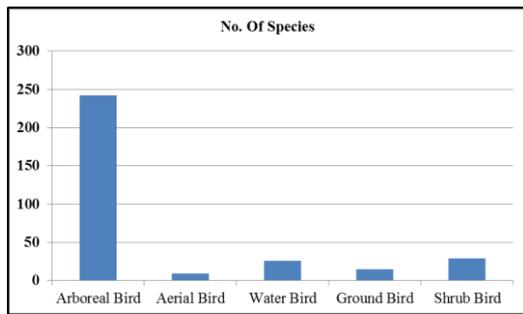
### Result and Discussion:

Based on my observations and the survey we completed, we compiled data regarding each bird we observed. Additionally, we record the birds' characteristics and classify it into a number of categories, including family distribution, feeding habits, migration status, habitat and IUCN status. Based on their family, birds were categorised. It is essential to categorise the diversity of birds by family. We discovered 321 species of birds from 74 different families, including the Cisticolidae, Alaudidae, Muscicapidae, Cuculidae, Ciconiidae, Accipitridae and others. Here, we have classified the birds according to their family distribution and habitat. The data we have categorised from the study area is shown in the following graphs. Based on the data we have collected over the past three years, graphs have been created. To determine the precise threat level of a certain species, avian diversity has been categorised as LC (Least Concern), NT (Near Threatened), VU (Vulnerable), EN (Endangered), and CR (Critically Endangered). In graph 1, birds are categorised according to their family while birds are also categorised according to the kinds of habitat in Graph 2. Arboreal habitat, aerial habitat, aquatic habitat (water birds), ground habitat, and shrub habitat are all types of bird habitats.



**Graph 1: Bird Diversity of Maval Tehsil (On the basis of Family)**

The family category is a crucial taxonomic rank which plays an important role to arranged and categorized organisms with similar traits. By assembling related genera into a family category organisms can be categorized in an organized manner. Focusing on the preservation of whole groups of related species is made easier by the family category. We frequently examine other species in the same family when a species is endangered in order to comprehend the wider ecological challenges. I categorised each bird I observed into this particular type of category, and a total of 321 birds were divided into 74 families with the Accipitridae family having the highest number of birds-27. The Muscicapidae family of birds has 21 different species. Many families including Ploceidae, Recurvirostridae, Upupidae, Aegithinidae and Coraciidae have only one species of bird.



**Graph 2: Bird Diversity of Maval Tehsil  
(On the basis of Habitat)**

Birds live in a variety of environments providing essential resources including food, shelter, place to build nests and protection against predators. These habitats are essential to the survival of bird species, and preserving them is essential to ecological balance and biodiversity. To breed, lay eggs, and raise chicks, birds require specific environment. Bird populations may decrease if habitats for breeding are inadequate. Birds are essential to their particular environments for pollination, seed distribution, and pest management. For instance, birds in forests help to regenerate trees by dispersing seeds. Birds show various types of habitat such as Arboreal, Aerial, Aquatic, Ground Bird and Shrub habitat. A total 5 categories are used to classify the birds in different groups on the basis of their habitat. Birds with the arboreal habitat are most dominant over all the birds with 242 numbers while the number of birds show aerial habitat is very less i.e. 09. Bird habitats are essential to both ecological balance and bird survival. Many bird species are supported by various habitats, which provide biodiversity, pollination, seed dispersal, pest control, and environmental stability. By preserving these habitats, bird species are going to stay alive and ecosystems around the world will remain healthy. A large percentage of the avifaunal community consists of arboreal birds, indicating the ecological dominance and importance of arboreal habitats in the study area.

Water birds, shrub birds, ground birds and a small percentage of aerial birds constitute a smaller portion of the bird population, indicating that although many different kinds of habitat types are utilized, arboreal habitats are the dominant ecological niche for most species. This distribution highlights that forest or abundant trees habitats have an important effect on habitat structure, supporting a number of feeding and nesting requirements.

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