

KERALA



Photo: M. Zafar-ul-Islem

The diverse forest types in Kerala provide habitats to 475 species of birds.

Kerala (8° 17' - 12° 47' North and 74° 52' - 77° 24' East) is one of the smaller states of India. With an area of 38,86,300 ha, Kerala constitutes about 1.18% of the land area of India. The State is divided into 14 administrative districts. The Union Territory of Lakshadweep is situated in the Arabian Sea off the coast of north Kerala. Tamil Nadu forms a border on the south and partly on the east, and Karnataka is located on the north and northeast. Its greatest length north to south is about 545 km and its greatest width is about 120 km, though most parts are considerably less wide (Ali 1999).

Kerala can be physiographically subdivided into Lowlands (< 75 m above msl), Midlands (75-500 m above msl), Highlands (500-780 m above msl) and High ranges (> 750 m above msl) (Iype *et al.* 1991). The Lowlands comprise the long and narrow coastal belt on the west with stretches of sand and backwaters. Extensive paddy fields and numerous coconut plantations dominate the landscape in this area.

In between the highland and lowland is the midland, which is undulating country covered by laterite soil cut across by rivers with isolated hills and plains leading to the forest-clad highlands. Paddy is the common crop in the valleys, while tapioca is cultivated on the slopes and highlands. The Western Ghats that bound Kerala on its eastern side, constitute dominant highland. While thick forests cover the upper ranges in this mountain area, the lower ranges have plantations, which are interspersed with forests. Crops such as tea, coffee, cardamom and turmeric abound in the higher elevations whereas in the sub-mountainous tracts and below the Ghats, crops like pepper, rubber and ginger are grown. The continuous mountain is broken only by the Palghat Gap, a transverse valley about 25 km wide which cuts across it, sharply dividing Wynaad and the Nilgiris from the Nelliampathi Hills of the Thrissur district, to their south (Ali 1999). The Wynaad tableland, 95 km by 50 km, at an average elevation of 900 m, is interesting for its avifauna and other fauna.

The rivers of Kerala have blessed the State with an abundance of water resources. Fortyfour rivers flow through Kerala. The bigger rivers are Bharatapuzha, Periyar, Pampa and Chaliyar which exceed 160 km in length, while all the others are relatively small with an average length of about 64 km (Sreedhara Menon 1997). The state has an extensive range of physical features that result in a corresponding diversity of climatic features. The high ranges of Kerala have a cool and bracing climate while the plains are hot and humid. The temperature ranges from 19.8 °C to 36.7 °C. Owing to the mountainous nature of the State, it receives heavy rainfall. However, there are some rain shadow areas that receive less than 1,000 mm rainfall. The most important of the rain shadow area is the Chinnar Wildlife Sanctuary (an IBA) where the rainfall is about 500 mm. However, in most of the other areas, the average annual rainfall varies between 1,520 to 4,075 mm, June being the month of the heaviest rainfall.

The State is the major producer of food crops like grains, cereals and pulses. The principal plantation crops are rubber, tea, coffee and cardamom. The total population is 31.84 million of which 74% is rural. The population density is 749 persons per sq. km, and it is one of the densely populated states of India (Ministry of Environment and Forest, 1999; Forests Survey of India, 2001).

The forests of Kerala are home to some of the endemic and endangered species of India. For example, Agasthyamalai is the abode of 150 endemic taxa of flowering plants. As far as balsams are concerned, the hills of Munnar are said to be the richest in the world, with more than 30 species of balsams within 16 sq. km (Pillay 1929, John 1936, Barnes 1939). Hora and Nair (1941) and Hora and Law (1941) have documented the fish fauna of the State. About 150 species of freshwater fish have been reported from the Western Ghats of Kerala as well from other parts of the State. According to Menon (1987) there are about 40 species of Indian freshwater fish, which are either seriously threatened or rare, and deserve immediate protection. A blind catfish, discovered in Kottayam (Menon 1950) is known only from Kerala. Ten endemic fish species have been reported from the State including *Puntius denisonii*, *Osteobrama bakeri* Day, *Garra surendranathanii*, *Osteochilus longidorsalis*, *Chela fasciata*, *Travancoria jonesi*, *Nemacheilus keralensis*, *Horabagrus brachysoma*, *Batario travancoria*, *Tetraodon travancoricus*; about 28 species of Endangered fish, and seven species of Critically Endangered fish *Pisoclonoplius boro*, *Tor tor*, *Travancoria jonesi*, *Horabiosia joshuai*, *Nemacheilus noomilis*, *Balitora mysorensis*, *Chela fasciata* have been reported (Biju *et al.* 2000).

Vegetation

The major forest types observed in Kerala are Tropical Evergreen, Tropical Semi-evergreen, Tropical Moist Deciduous, Dry Deciduous, Montane *Sholas*, Savannas, Grasslands and Lowland Scrub jungles. The outstanding feature of the Western Ghats of Kerala is the development of Tropical Rain Forest towards the south between 500-1500 m (Subramanyam and Nayar 1974, Chandrasekaran 1962). The flora and fauna of the Western Ghats in general have been discussed by several authors like Blasco (1970); Krishnan (1974); Mani (1974); Subramanyam and Nayar (1974); Nayar (1977; 1980a; 1980b); Ahmedullah and Nayar (1987); Rao (1978); Pascal (1988); Nair and Daniel (1986); Nair (1991). Ali (1999) has broadly divided the forest of Kerala into four classes, as follows:

- (i) Heavy Moist Evergreen, confined to the Ghats (chiefly the western slopes) and ravines, and perhaps to one-third of the upper hill plateau.
- (ii) Land originally covered with Evergreen Forest, but now overgrown by secondary scrub jungles of various ages.
- (iii) Deciduous Forest with tall coarse grass growing under the trees which cover the ridges and higher ground and a part of the hill plateau.
- (iv) Rock and stony land covered with short grass (*shola* grasslands).

IBAs AND PROTECTED AREAS

Kerala has a long history of protecting wild animals. There are three national parks and 12 wildlife sanctuaries in the state covering 2,67,988 ha which form 28.5% of the forest area in the State and 6.8% of the geographical area. The State has some of the most well-known sanctuaries of India such as the Periyar Tiger Reserve, the Eravikulam National Park, the Parambikulam Wildlife Sanctuary and the Silent Valley National Park (all selected as IBAs).

Number of IBAs and IBA criteria

A1= Threatened species; A2 = Restricted Range species; A3= Biome species; A4=Congregatory species

IBAs of Kerala

IBA site codes	IBA site names	IBA criteria
IN-KL-01	Amarambalam Reserve Forest	A1, A2, A3
IN-KL-02	Aralam Wildlife Sanctuary	A1, A2
IN-KL-03	Chimmony Wildlife Sanctuary	A1, A2, A3
IN-KL-04	Chinnar Wildlife Sanctuary	A1, A2, A3
IN-KL-05	Eravikulam National Park	A1, A2, A3
IN-KL-06	Idukki Wildlife Sanctuary	A1, A2
IN-KL-07	Kattampally	A1
IN-KL-08	Kole Wetland	A1, A4i, A4iii
IN-KL-09	Konni Reserve Forest	A1, A2
IN-KL-10	Kottiyoor Reserve Forest	A1, A2, A3
IN-KL-11	Kulahupuzha Reserve Forest	A1, A2
IN-KL-12	Nelliyampathy (Nemmara Division)	A1, A2
IN-KL-13	Neyyar Wildlife Sanctuary	A1, A2, A3
IN-KL-14	Parambikulam Wildlife Sanctuary	A1, A2, A3
IN-KL-15	Peechi-Vazhani	A1, A2, A3
IN-KL-16	Peppara Wildlife Sanctuary	A1, A2, A3
IN-KL-17	Periyar Tiger Reserve	A1, A2, A3
IN-KL-18	Ranni Reserve Forest	A1, A2, A3
IN-KL-19	Shendurney Wildlife Sanctuary	A1, A2, A3
IN-KL-20	Silent Valley National Park	A1, A2, A3, A4
IN-KL-21	Thattekkad Bird Sanctuary	A1, A2, A3
IN-KL-22	Vazhachal Forest Division	A1, A2, A3
IN-KL-23	Vembanad Lake	A3, A4i, A4iii
IN-KL-24	Waynaad Wildlife Sanctuary	A1, A2, A3

AVIFAUNA

About 475 species of birds have been recorded in the State, of which 149 species are found in the coastal areas and the remaining in the mid and highlands (Neelakantan *et al.* 1993). These constitute about 25% of Indian avifauna. K. V. Eldose and Thomas Zacharias (unpublished) have listed 463 species, some not noted by Neelakantan *et al.* (1993) or Ali (1999). Kerala has a long history of ornithological surveys. Based on the birds collected by Fulton and Frank Bourdillon, A. O. Hume wrote two papers in Stray Feathers (Hume 1876, 1878). At almost the same time, H. S. Ferguson, another tea planter, collected birds and wrote a series of papers in JBNHS (Ferguson and Bourdillon 1903, 1904). An exhaustive investigation of the forest birds of Travancore was conducted by Ali and Whistler (1935-1937). Again, the narrative works of Ali (1969) have documented the avifauna of the State. Since then several workers have made further observations in different parts of the protected areas of the State (eg. Vijayan and Balakrishnan 1977, Vijayan 1978, Zacharias and Gaston 1993, Srivasthava *et al.* 1993).

Among the Critically Endangered species, the Oriental White-backed Vulture *Gyps bengalensis* is present in the State. BirdLife International (2001) has listed 10 Endangered species, of which, the Nilgiri Laughingthrush *Garrulax cachinnans* has definitely been recorded in two IBAs. The Spot-billed Pelican *Pelecanus philippensis*, Lesser Adjutant *Leptoptilos javanicus* and Yellow-throated Bulbul *Pycnonotus xantholaemus* are occasionally seen. In Kerala, 13 out of 57 Vulnerable species listed for India by BirdLife International (2001) are found. Ten of these 13 are found in the IBAs, while three have stray records (Sociable Lapwing *Vanellus gregarius*, Spoon-billed Sandpiper *Calidris pygmaea* and Green Munia *Amandava formosa*: listed by Eldose and Zacharias, unpublished). The Green Munia could be escaped birds from pet trade.

BirdLife International (2001) has listed 52 Near Threatened bird species for India, 15 of them occur in Kerala. The IBAs and protected areas of Kerala are extremely important for the long-term survival of seven bird species. In the biome classification done by BirdLife International (undated), Kerala lies in Biome-10 (Indian Peninsula Tropical Moist Forest), where 15 species are considered as representative of this biome. All of them are found in Kerala. Like in any other state, birds of other biomes, such as Biome-5 (Eurasian High Montane-Alpine and Tibetan), Biome-7 (Sino-Himalayan Temperate Forest), Biome-8 (Sino-Himalayan Subtropical Forest) and Biome-11 (Indo-Malayan Tropical Dry Zone) are also found, most as migratory birds. In the case of Biome-11, BirdLife International (undated) has listed 59 species, out of which 48 are found in Kerala. However, most of the birds of this biome are common and widespread, so their occurrence in Kerala is not surprising.

Black-and-Orange Flycatcher *Ficedula nigrorufa* is one of the 16 endemic birds of Western Ghats.



Photo : R. Vijaykumar Thondaman

List of threatened birds with IBA site codes

Critically Endangered		
Oriental White-backed Vulture	<i>Gyps bengalensis</i>	IN-KL-17, 24
Long-billed Vulture	<i>Gyps indicus</i>	IN-KL-17, 24
Endangered		
Nilgiri Laughingthrush	<i>Garrulax cachinnans</i>	IN-KL-20
Vulnerable		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-KL-08
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-KL-01, 14, 24
Greater Spotted Eagle	<i>Aquila clanga</i>	IN-KL-07, 08, 17
Lesser Kestrel	<i>Falco naumanni</i>	IN-KL-19, 24
Wood Snipe	<i>Gallinago nemoricola</i>	IN-KL-17, 19, 24
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>	IN-KL-01, 02, 05, 06, 09, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 24
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>	IN-KL-04
White-bellied Shortwing	<i>Brachypteryx major</i>	IN-KL-05, 11, 12, 16, 17, 20, 21
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>	IN-KL-05, 10, 12, 15, 17, 20, 21
Near Threatened		
Darter	<i>Anhinga melanogaster</i>	IN-KL-03, 06, 07, 08, 13, 14, 15, 16, 17, 19, 21, 22, 23, 24
Painted Stork	<i>Mycteria leucocephala</i>	IN-KL-08
Oriental White Ibis	<i>Threskiornis melanocephalus</i>	IN-KL-07, 08, 23
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>	IN-KL-01, 03, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 24
Cinereous Vulture	<i>Aegypius monachus</i>	IN-KL-08
Red-headed Vulture	<i>Sarcogyps calvus</i>	IN-KL-24
Pallid Harrier	<i>Circus macrourus</i>	IN-KL-01, 21, 24
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-KL-08, 24
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>	IN-KL-01, 02, 14, 22
Great Pied Hornbill	<i>Buceros bicornis</i>	IN-KL-01, 03, 06, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24
Nilgiri Pipit	<i>Anthus nilghiriensis</i>	IN-KL-05, 10, 11, 12, 13, 14, 15, 17, 20
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>	IN-KL-02, 05, 13
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>	IN-KL-01, 02, 05, 12, 14, 17, 20
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>	IN-KL-01, 02, 03, 05, 06, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 24

THREATENED BIRDS FOR WHICH KERALA IS EXTREMELY IMPORTANT

Nilgiri Wood-Pigeon *Columba elphinstonii* **Vulnerable**

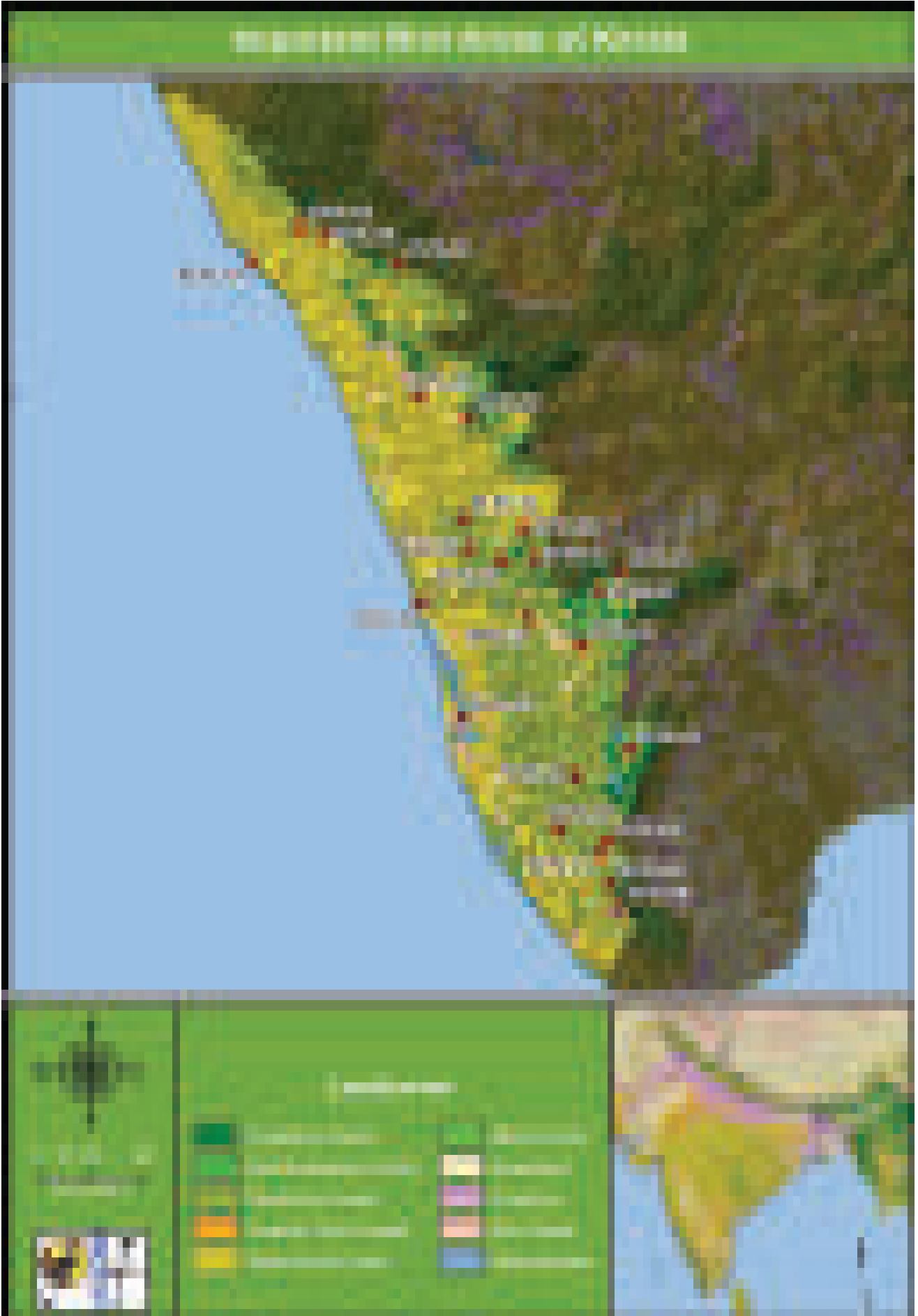
This pigeon of the evergreen biotope is resident in Kerala. It is found from the foothills to the highest *sholas*, wherever tall fruiting trees are found (Ali 1999). It has been specifically reported in Thirunelli (Prasad *et al.* 1998, Zacharias and Gaston 1999), Wynaad Wildlife Sanctuary (Zacharias and Gaston 1993), Silent Valley National Park (Jayson 1990, Vijayan *et al.* 1992, Vijayan *et al.* 1999), Parambikulam Wildlife Sanctuary (Vijayan 1978), Eravikulam National Park (BirdLife International 2001), Munnar (Zacharias and Gaston 1999), Thattekad Bird Sanctuary (Ali and Whistler 1935-1937, Sugathan and Verghese 1996, Zacharias and Gaston 1999), Idukki Wildlife Sanctuary (Prasad *et al.* 1998), Periyar (Robertson and Jackson 1992, Vijayan 1984, Srivastava *et al.* 1993, Zacharias and Gaston 1999), Shendurney Wildlife Sanctuary (BirdLife International, 2001), Agasthyamalai (Prasad *et al.* 1998, Gaston and Zacharis 1996, Zacharias and Gaston 1999) and Peppara Wildlife Sanctuary (BirdLife International 2001).

White-bellied Shortwing *Brachypteryx major albiventris* **Vulnerable**

There are two subspecies of the White-bellied Shortwing: *Brachypteryx major major* (nominate) of the Nilgiris, Brahmagiris and adjacent hill ranges as far north as the Bababudans of West Kerala, and *Brachypteryx major albiventris* of Kerala. This species is restricted to the evergreen biotope in the hills from 900 m upward to the highest *sholas* (Ali 1999). It has been specifically reported from Thirunelli and elsewhere in the Wynaad district (Zacharias and Gaston 1993, 1999), Eravikulam National Park (Gee 1995), Munnar (Whistler 1935, Primrose 1938, Gaston and Zacharias 1996); Thattekad Bird Sanctuary (BirdLife International 2001) and Periyar Tiger Reserve (Vijayan 1984, Robertson and Jackson 1992, Zacharias and Gaston 1999).

Nilgiri Laughingthrush *Garrulax cachinnans* **Endangered**

It is one of the most narrowly Restricted Range species of the Western Ghats (Zarri and Rahmani in preparation). It is common in the suitable habitat of the Nilgiris of Tamil Nadu. In Kerala, it has been reported on the western slopes of the Nilgiris on the Kerala side, up to Wynaad, above 1000 m (Ali 1999). It has been reported in the Silent Valley National Park (Zacharias and Gaston 1999, Vijayan *et al.* 1999) and Munnar (BirdLife International 2001).



Broad-tailed Grass-Warbler *Schoenicola platyura* **Vulnerable**

The Broad-tailed Grass-Warbler or Grassbird is restricted to grassy hillsides, principally in the Western Ghats, at least in the breeding season (BirdLife International 2001). In Kerala it is resident and not uncommon (Ali 1999) in Ashambu, Cardamon, High Range and Anaimalai, between c. 900 and 2600 m. It has been specifically reported from Thirunelli (Zacharias and Gaston 1999); Wynaad (Davison 1883) and recently judged uncommon (Zacharias and Gaston 1999); Silent Valley National Park (Santharam, 1996, Gaston and Zacharias, 1996); Munnar (Zacharias and Gaston 1999); Periyar Tiger Reserve (Robertson and Jackson 1992, Srivastava *et al.* 1993, Zacharias and Gaston 1999, Holt 1995); and Agasthyamalai (Zacharias and Gaston 1999).

Restricted Range species

Kerala lies in the Western Ghats Endemic Bird Area (EBA 123) (Stattersfield *et al.* 1998). In this EBA, 16 birds are endemic or Restricted Range. Of the 16 species, three are Vulnerable, namely Nilgiri Wood-Pigeon *Columba elphinstonii*, White-bellied Shortwing *Brachypteryx major* and Broad-tailed Grass-Warbler *Schoenicola platyura*. Four are Near Threatened such as the Grey-breasted Laughingthrush *Garrulax jerdoni*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, Nilgiri Flycatcher *Eumyias albicaudata* and Nilgiri Pipit *Anthus nilghiriensis*. For many Restricted Range species, the IBAs of Kerala are extremely important for long-term survival.

Endemic Bird Area 123: Western Ghats		
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>	IN-KL-01, 02, 05, 06, 09, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 24
Blue-winged Parakeet	<i>Psittacula columboides</i>	IN-KL-01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 24
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>	IN-KL-01, 02, 04, 05, 10, 11, 12, 13, 15, 16, 17, 19, 20, 21, 22, 24
Nilgiri Pipit	<i>Anthus nilghiriensis</i>	IN-KL-04, 05, 10, 11, 12, 13(?), 17, 19, 24
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>	IN-KL-01, 02, 03, 05, 10, 11, 13, 17, 19, 20, 21, 22, 24
White-bellied Shortwing	<i>Brachypteryx major</i>	IN-KL-05, 11, 12, 16, 17, 20, 21, 24
Wynaad Laughingthrush	<i>Garrulax delesserti</i>	IN-KL-02, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 24
Nilgiri Laughingthrush	<i>Garrulax cachinnans</i>	IN-KL-20, 24
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>	IN-KL-02, 05, 13, 20, 24
Indian Rufous Babbler	<i>Turdoides subrufus</i>	IN-KL-01, 02, 03, 05, 10, 11, 12, 13, 14, 15, 17, 20, 21, 22, 24
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>	IN-KL-10, 12, 15, 17, 21, 24
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>	IN-KL-05, 12, 17, 20, 24
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>	IN-KL-02, 05, 11, 12, 13, 17, 19, 20, 24
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>	IN-KL-01, 02, 03, 05, 10, 11, 12, 13, 17, 19, 20, 21, 22, 24
Small Sunbird	<i>Nectarinia minima</i>	IN-KL-01, 02, 03, 05, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 24
White-bellied Treepie	<i>Dendrocitta leucogastra</i>	IN-KL-01, 02, 05, 10, 11, 15, 17, 19, 20, 21, 22, 24

THREATS AND CONSERVATION ISSUES

The anthropogenic pressure on the forests in Kerala is very intense. To ensure the survival of endemic endangered and rare species, it is vital to protect and maintain the Evergreen and Semi-evergreen Forests of the State. There is need to encourage scientific studies with respect to avifauna and flora. The State has a long history of conservation and protecting wild animals and birds. Sacred groves have existed in India from time immemorial as patches of densely wooded areas, and are venerated as religious grounds. In Kerala, it is common among Hindus to assign a part of their land as the abode of goddess 'Durga' or the serpent god 'Naga'. These sacred grooves have preserved many rare and endemic plants, animals, and birds.

Threats to IBAs

A=Agriculture intensification/expansion; B=Dams/Dykes; C=Disturbance to Birds; D=Firewood Collection; E=Industrialisation/Urbanisation; F=Unsustainable exploitation; G=Others; H=Natural Events

Wetlands in Kerala are under extreme pressure due to the high population density of the State. For example, as much as two-thirds of the Vembanad Lake has been either reclaimed as land or converted into fields for agricultural and fishery activities (Gopalan 1991). Wetlands in Kerala are mainly used for agriculture, pisciculture, and reclamation for housing and industrial purposes. In addition, the wetlands are used for disposing of waste materials, and for discharging industrial effluents and municipal waste water, for wood seasoning, for feeding water for ducks, dumping dredged soil, coir retting and for hunting and fishing (Balachandran *et al.* 2002).

The rivers of Kerala have been harnessed for several hydroelectric projects such as Pallivasal, Sabarigiri and Idukki and for irrigation projects like Malampuzha, Periyar Valley, Peechi and Kallada (Vijayan and Balakrishnan 1977). In Kerala, there are 250 polluting large and medium-scale industries and about 2000 polluting small-scale industries. Most of these industries draw water from the rivers and discharge effluents into them (Venugopalan Nair 1997 and Aziz and Nair 1987).

The ecological status of mangroves is not well appreciated. The indiscriminate exploitation of mangroves for timber, poles and firewood is considered as the major cause of mangrove depletion. A glaring example is the Vembanad wetland region, once, a large mangrove swamp, (a decade ago). At present it is modified into settlements, agricultural fields and filtration ponds.

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Some of the rivers have been harnessed for several hydroelectric projects.

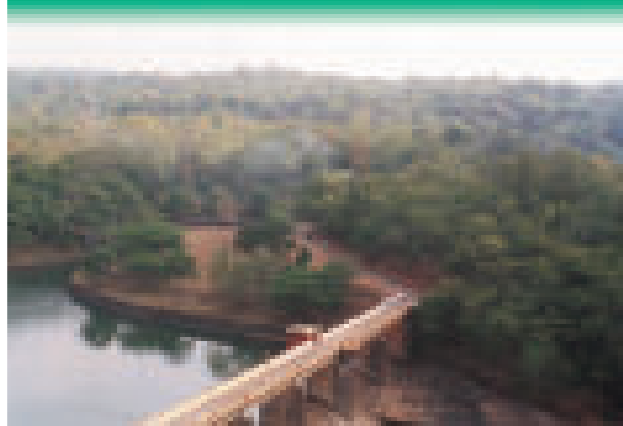


Photo: M. Zaifur-ul-Islam

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AMARAMBALAM RESERVE FOREST – NILAMBUR



IBA Site Code	: IN-KL-01
State	: Kerala
District	: Malapuram
Coordinates	: 11° 13' 60" N, 76° 10' 60" E
Ownership	: State
Area	: 26,572 ha
Altitude	: 40 – 2,554 m
Rainfall	: >3,000 m
Temperature	: Not available
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Dry Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats); A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Amarambalam Reserve Forest is one of the largest reserve forests of Kerala. It shows very high altitudinal gradation from 40 m to 2554 m, and coupled with high rainfall, the forest cover is extremely thick. It continues with the Silent Valley National Park (an IBA) and also forms a part of the Nilgiri Biosphere Reserve (Sharma *et al.* 2000).

AVIFAUNA

P. O. Nameer, State Coordinator of Indian Bird Conservation Network (IBCN) has identified 212 species of birds from Nilambur and Amarambalam reserve forests. The site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998) where 16 Restricted Range species have been identified. Eight such species have been sighted in this IBA. Beside the Restricted Range species, one Critically Endangered, and two Vulnerable species are also known to occur.

BirdLife International (2001) has also identified 52 Near Threatened species in India. Three of them are found in this IBA, but more are likely to be found once detailed studies are conducted.

Amarambalam Reserve Forest lies in Biome-10 (Indian Peninsula Tropical Moist Forest), classified by BirdLife International (undated). In this Biome, 15 bird species have been identified as typical biome assemblage. Twelve such species are found in this IBA. Interestingly, P. O. Nameer (*pers. comm.* 2003) has seen 11 species of woodpeckers and three species of barbets, seven species of bulbuls, nine species of babblers and 11 species of flycatchers. This shows that the habitat, at least for birds, is still intact in this site.

Sharma *et al.* (2000) found high bird diversity index comparable to other areas. Shannon-Weiner Index was 3.73 and Simpson's Index of diversity was 0.04. The bird community showed high evenness. Maximum species richness was obtained during November and highest diversity index was recorded during April.

Critically Endangered

Oriental White-backed Vulture *Gyps bengalensis*

Vulnerable

Lesser Adjutant *Leptoptilos javanicus*

Nilgiri Wood-Pigeon *Columba elphinstonii*

Near Threatened

Greater Grey-headed Fish-Eagle *Ichthyophaga ichthyaetus*

Pallid Harrier *Circus macrourus*

Great Pied Hornbill *Buceros bicornis*

Endemic Bird Areas 123: Western Ghats

Nilgiri Wood-Pigeon *Columba elphinstonii*

Blue-winged Parakeet *Psittacula columboides*

Malabar Grey Hornbill *Ocyrceros griseus*

Grey-headed Bulbul *Pycnonotus priocephalus*

Indian Rufous Babbler *Turdoides subrufus*

White-bellied Blue-Flycatcher *Cyornis pallipes*

Small Sunbird *Nectarinia minima*

White-bellied Treepie *Dendrocitta leucogastra*

Biome-10: Indian Peninsula Tropical Moist Forest

Small Green-billed Malkoha *Phaenicophaeus viridirostris*

Jerdon's Nightjar *Caprimulgus atripennis*

Indian Edible-nest Swiftlet *Collocalia unicolor*

Malabar Trogon *Harpactes fasciatus*

White-cheeked Barbet *Megalaima viridis*

Crimson-throated Barbet *Megalaima rubricapilla*

Yellow-browed Bulbul *Iole indica*

Malabar Whistling-Thrush *Myiophonus horsfieldii*

Indian Scimitar Babbler *Pomatorhinus horsfieldii*

Black-headed Babbler *Rhopocichla atriceps*

Loten's Sunbird *Nectarinia lotenia*

Black-throated Munia *Lonchura kelaarti*

OTHER KEY FAUNA

This site has almost all the large and small mammals found in the Western Ghats. Sharma *et al.* (2000) have reported 25 mammals, including the endemic and threatened Lion-tailed Macaque *Macaca silenus* and Nilgiri Tahr *Hemitragus hylocrius* (observed near Mukurthi NP, another IBA).

LAND USE

q Forestry

THREATS AND CONSERVATION ISSUES

Not known

KEY CONTRIBUTOR

P. O. Nameer

The endemic White-bellied Treepie *Dendrocitta leucogastra* is seen in the reserve forests.



Photo: R. Vijaykumar Thondaman

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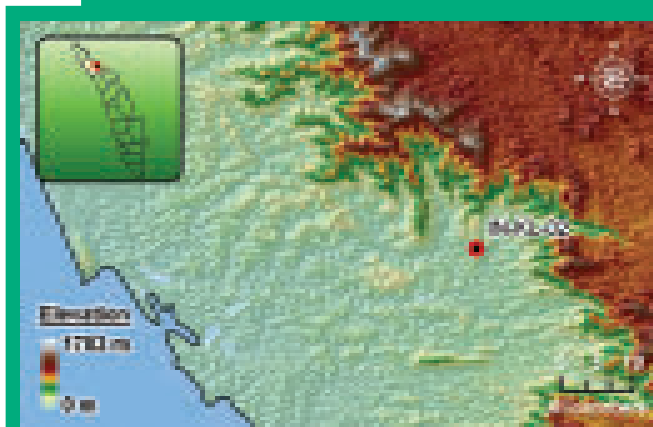
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ARALAM WILDLIFE SANCTUARY



IBA Site Code	: IN-KL-02
State	: Kerala
District	: Kannur
Coordinates	: 12° 02' 50" N, 75° 41' 54" E
Ownership	: State
Area	: 5,500 ha
Altitude	: 50 – 1,145 m
Rainfall	: 3,000 mm
Temperature	: 8 °C to 40 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen Forest, Tropical Semi Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Wildlife Sanctuary, established in October 1984

GENERAL DESCRIPTION

The Aralam Wildlife Sanctuary, in the southeastern side of the Kannur District of Kerala, is a compact 55 sq. km area with rich floral and faunal diversity. The Sanctuary area lies between Aralam and Kottiyoor villages. The nearest railhead is at Tellicherry, about 70 km from the Sanctuary. The area is well connected by road from Tellicherry, Kannur, Wynaad and Veerajpetta (Menon 1999).

Biogeographically, the Aralam Wildlife Sanctuary is located in the Western Ghats. Though the Sanctuary is not included in the Nilgiri Biosphere Reserve, it has all the characteristic important endemics of the Western Ghats (Menon 1999).

The primary vegetation of this IBA is evergreen forest, but in the disturbed areas such as Valayanchal and Kurukkathodu, there are many deciduous trees, making the forest semi-evergreen (Sashi Kumar *et al.* 2000).

Aralam Wildlife Sanctuary is the only protected area of the West Coast Tropical Evergreen forest of *Dipterocarpus-Mesua-Palaquium* type (Nair 1991). Less than 25 sq. km of fairly undisturbed forest of this type is included in this Sanctuary.

Paripputhodu (towards Uruppukunnu), Uruppukunnu, Kannadivechakunnu and the whole stretch of forest from Chavachi to Ambalappara are good representative of this forest type. *Dipterocarpus*, *Calophyllum* and *Palaquium* dominates in Uruppukunnu. On the upper regions of the Sanctuary, four different tree associations can be seen. On the upper reaches of Ambalappara, stunted evergreen forest with dominance of species of the Family Lauraceae. It is similar to *shola* grassland vegetation of the upper reaches of the Western Ghats. At mid elevations, wet evergreen of *Calophyllum-Palaquium-Myristica* is found. Further down, we find *Dipterocarpus* dominated forests. About 4.5 sq km is under teak, eucalyptus and cashew plantations, now without any forestry operations and therefore overgrown with secondary growth (Sashi Kumar *et al.* 2000).

AVIFAUNA

Nearly 190 species of birds have been recorded (Sashi Kumar *et al.* 2000, Sashi Kumar and Palot 2002). One Red data book species Nilgiri Wood-Pigeon *Columba elphinstonii*, 12 restricted range species, and 18 species of Schedule I of the Indian Wildlife (Protection) Act, 1972 have been reported. Malabar Pied Hornbill

Anthracoceros coronatus, a Near Threatened species, according to BirdLife International (2001), is observed in Paripputhodu region. Great Pied Hornbill *Buceros bicornis* and Malabar Grey Hornbill *Ocyrceros griseus* are also found in the Sanctuary. Nesting of Malabar Grey Hornbill was recorded at Valayanchal (Sashi Kumar *et al.* 2000).

A population of two Restricted Range (endemics) and Near Threatened: Black-and-Orange Flycatcher *Ficedula nigrorufa* and Grey-breasted Laughingthrush *Garrulax jerdoni*, is reported from the eastern highlands of the Ambalappara region in the Sanctuary. These endemic birds, along with the Black Bulbul *Hyppipetes leucocephalus*, Grey-headed Flycatcher *Culicicapa ceylonensis*, Oriental White-eye *Zosterops palpebrosus* and Tickell's Leaf Warbler *Phylloscopus affinis* are regularly seen in the Ambalappara region.

Black Baza *Aviceda leuphotes*, Rufous-bellied Eagle *Hieraaetus kienerii*, Ceylon Frogmouth *Batrachostomus moniliger* and Oriental Broad-billed Roller *Eurystomus orientalis* are other uncommon birds recorded from this IBA.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Near Threatened	
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>

OTHER KEY FAUNA

The Sanctuary is very well protected and conducive to the presence of animal populations. Most of the animals seen in the nearby Wynaad Wildlife Sanctuary are also sighted here. No census has been conducted in the Sanctuary and therefore a realistic figure regarding the animal population is not available, but the following mammals are commonly seen: Bonnet Macaque *Macaca radiata*, Lion-tailed Macaque *Macaca silenus*, Nilgiri Langur *Trachypithecus johni*, Slender Loris *Loris lydekkerianus*, Tiger *Panthera tigris*, Leopard *Panthera pardus*, Jungle Cat *Felis chaus*, Civets, Mongoose, Wild Dog *Cuon alpinus*, Elephant *Elephas maximus* and Gaur *Bos gaurus*. Thirty-three species of fish were recorded from this site (Shaji *et al.* 1995), including many endemics to the Western Ghats.

LAND USE

- q Forestry
- q Tourism

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Firewood collection

Except for firewood collection and some poaching, there is no major irreversible threat to this IBA. The number of tribals inside the Sanctuary is small (about 60). They live in four isolated clusters. A sizeable number of them can get seasonal employment in

plantations for fire protection activities, etc.

A tribal school can be set up outside the Sanctuary for imparting better education to their children. So also, drinking water supply can be provided to the tribals. If suitable land is available, resettling the tribals outside the Sanctuary may be considered. The local people other than the tribals are also bound to benefit from the increased developmental activities. Tourist traffic can provide extra employment to a number of people, provided this is planned thoroughly.

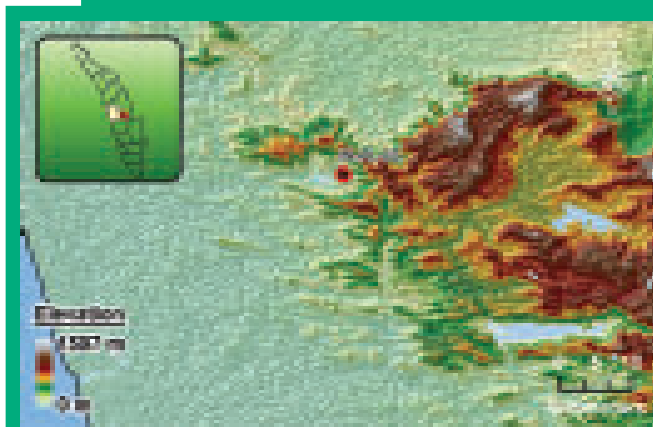
KEY CONTRIBUTORS

C. Sashi Kumar and Mohammed Jafar Palot

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CHIMMONY WILDLIFE SANCTUARY



IBA Site code	: IN-KL-03
State	: Kerala
District	: Trichur
Coordinates	: 10° 24' 19" N, 76° 35' 55"E
Ownership	: State
Area	: 9,000 ha
Altitude	: 1,126–2,500 m
Rainfall	: 2,980 mm
Temperature	: 15 °C to 36 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen, Tropical Moist Scrub

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1984

GENERAL DESCRIPTION

The Chimmony Wildlife Sanctuary, situated east of the Parambikulam Wildlife Sanctuary, is of considerable ecological importance. It forms a continuous stretch of natural forests with Parambikulam Wildlife Sanctuary. It is one of the westernmost segments of the proposed Anamalai-Anamudi Conservation Unit, which starts from Chinnar Wildlife Sanctuary in the east and stretches up to Peechi Wildlife Sanctuary as a continuous belt. The landform of the Sanctuary has an extremely varying topography. The territorial boundary of the Sanctuary roughly coincides with the watershed of the Chimmony river (Menon 1997). The innumerable channels of the river had carved the entire landscape into such a diverse topography that it is unique to this region.

The climate is fairly equable in the Sanctuary. The dry season extends from December to April and the wet season from May to November. The hottest months are March, April and May. The bulk of the annual rainfall comes from the southwest monsoon. The tract receives an average rainfall of about 2,980 mm annually.

Chimmony Wildlife Sanctuary consists of West Coast Tropical Wet Evergreen Forests, West Coast Semi-evergreen Forests, Moist Deciduous Forests and teak plantation nearly 35 years old (Champion and Seth 1968, Jayson 1999). The Evergreen forest is composed of *Palaquium ellipticum*, *Calophyllum tomentosum*, *Cullenia exarillata*, *Dipterocarpus indicus*, *Artocarpus hirsuta*, *Bombax ceiba* and *Syzygium cumini*. Lower canopy consists of species such as *Cinnamomum zeylanicum*, *Mallotus philipensis* and *Zanthoxylum flavescens*. *Calamus travancoricus*, *Ixora* sp. and *Laportea crenulata* are seen in the undergrowth. According to Jayson (1999), most of the area of the Sanctuary consists of Moist Deciduous Forest, which merges with Semi-evergreen at higher elevations.

AVIFAUNA

A total of 160 species of birds has been recorded in a survey conducted by the Nature Education Society, Trichur, (NEST) in collaboration with the Kerala Forest Research Institute (Nameer 1992). Although no globally threatened species was recorded, five Restricted Range or endemic species were identified. The site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998), one of the biodiversity hotspots of the world.

BirdLife International (undated) has identified 15 species which represents biome assemblages of the Western Ghats. This site comes under Biome-10 (Indian Peninsula Tropical Moist Forest). Based on the checklist prepared by NEST (Nameer 1992), nine of these biome species are found at this site. Once more detailed research is conducted, more species of this biome are likely to be found here.

Near Threatened

Darter	<i>Anhinga melanogaster</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>

Endemic Bird Areas 123: Western Ghats

Blue-winged Parakeet	<i>Psittacula columboides</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>

Biome-10: Indian Peninsula Tropical Moist Forest

Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>

OTHER KEY FAUNA

Out of the 47 large mammals reported from Kerala, 22 are found in Chimmony (Jayson 1997). Rare, endemic and endangered species include Nilgiri Langur *Trachypithecus johni*, Lion tailed Macaque *Macaca silenus*, Slender Loris *Loris lydekkerianus*, Leopard Cat *Prionailurus bengalensis*, Wild Dog *Cuon alpinus*, Indian Giant Squirrel *Ratufa indica*, Asian Elephant *Elephas maximus*, Gaur *Bos gaurus*, Mouse Deer *Moschiola meminna* and Tiger *Panthera tigris*.

LAND USE

- q Nature conservation

THREATS AND CONSERVATION ISSUES

- q Grazing
- q Collection of firewood

The boundaries of the Chimmony Wildlife Sanctuary were drawn on the basis of physical barriers and ecological continuity was not considered. Extensive Evergreen and Semi-evergreen forests around the Sanctuary which harbour several endangered species, do not come within the limits of any protected area (O. P. Kaler, Wildlife Warden, 2001, pers. comm.).

Beyond the eastern boundary of Chimmony lie large tracts of evergreen forests of Parambikulam. To the south and southwest are the evergreen forests of Vazhachal and Chalakudy Forest Division. These areas have to be included in the Anamalai-Anamudi Conservation Unit, thus joining Chinnar and Indira Gandhi Wildlife sanctuaries in the east to Peechi Wildlife Sanctuary in the west.

Fortunately, Chimmony Wildlife Sanctuary is free from human habitation, except for the former Kallichitra tribal settlement. This settlement was relocated when Chimmony reservoir was filled up. However, the tribals are not happy in their new settlement and

want more land and compensation. There is no cultivation inside the Sanctuary and the pressure of cattle grazing is also low.

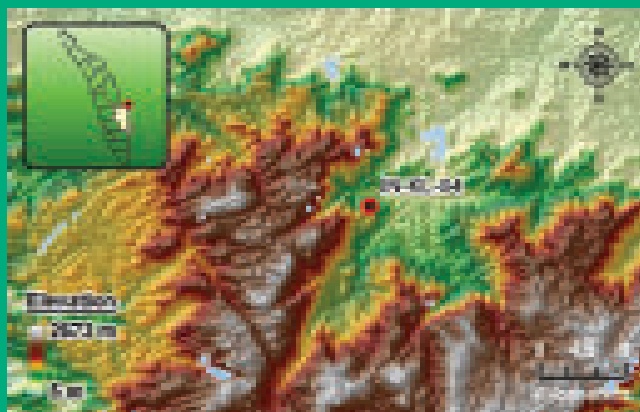
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P. O. Nameer and the IBA team

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CHINNAR WILDLIFE SANCTUARY



IBA Site Code	: IN-KL-04
State	: Kerala
District	: Idukki
Coordinates	: 10° 20' 33" N, 77° 11' 45" E
Ownership	: State
Area	: 9,044 ha
Altitude	: 400 - 2,400 m
Rainfall	: 500 mm
Temperature	: 12 °C to 38 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Moist Deciduous, Tropical Dry Deciduous, Tropical Thorn Forest, Riverine Vegetation, Montane Wet Temperate Forest, Montane Grassy Slopes

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest; Biome-11: Indo-Malayan Tropical Dry Zone)

PROTECTION STATUS: Wildlife Sanctuary, established in October 1984

GENERAL DESCRIPTION

Chinnar Wildlife Sanctuary comprises an area of 9,044 ha along the rain shadow region of the Western Ghats. This area was formerly known as Chinnar Reserve Forest and was a part of Marayoor Range of Munnar Forest Division. Considering its ecological, faunal, floral and geomorphological significance, it was declared as the Chinnar Wildlife Sanctuary in 1984.

Chinnar Wildlife Sanctuary has a special status compared to other sanctuaries in Kerala due to the presence of thorn scrub jungle. Being in a rain shadow area, rainfall in some areas is about 500 mm. The importance of Chinnar Wildlife Sanctuary is enhanced by its proximity to Eravikulam National Park (IBA) in the west and Annamalai Wildlife Sanctuary (IBA) in north and east. Thus it serves as a corridor for the movement and dispersal of animals.

Chinnar Wildlife Sanctuary is one of the two regions in Kerala on the leeward side of the Western Ghats (Sasidharan, undated). Because of these climatic and geographic characteristics, the flora resembles that of Deccan region. The Chinnar is perhaps the driest sanctuary of Kerala, with notable absence of semi-evergreen and evergreen forests. The scrub and dry vegetation is highly prone to fire.

The vegetation of the Sanctuary can be described as Southern Tropical Thorn Forest, Dry Deciduous Forest, Moist Deciduous Forest, Riparian Forest, hill shola forest and grassland (Sasidharan, undated). The dominant plant species of the Sanctuary are represented by *Chloroxylum swietenia*, *Anogeissus latifolia*, *Strychnos potatorum* and *Ixora arborea* (Chandrashekhara *et al.* 2002).

AVIFAUNA

Despite its unique status for Kerala state for being dry where all other regions are quite wet, not much work has been conducted on the avifauna of this Sanctuary. The earlier management plan listed only 10 bird species! Nameer and George (1991) during short stay compiled a list of 116 birds but added "it should not be taken as the last word on the avifauna of this bird rich region."

As this site does not have typical forest cover of the Western Ghats, not many of the endemic birds of the Western Ghats (16 in total) were recorded here. Interestingly, the globally threatened Yellow-throated Bulbul *Pycnonotus xantholaemus*, a bird

endemic to the boulder-strewn scrub forests of peninsular India (Ali and Ripley 1987, Grimmet *et al.* 1998) is found here (P. O. Nameer 1995). This is the only site in Kerala where this species is found. Also, the Near threatened Nilgiri Pipit *Anthus nilghiriensis* is seen here.

Vulnerable	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
Near Threatened	
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Endemic Bird Area 123: Western Ghats	
Blue-winged Parakeet	<i>Psittacula columboides</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Secondary Area s072: Southern Deccan Plateau	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
Biome-11: Indo-Malayan Tropical Dry Zone	
Jungle Bush-Quail	<i>Perdica asiatica</i>
Rock Bush-Quail	<i>Perdica argoondah</i>
Indian Peafowl	<i>Pavo cristatus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Indian Robin	<i>Saxicoloides fulvicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Jungle Babbler	<i>Turdoides striatus</i>
White-headed Babbler	<i>Turdoides affinis</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Ashy Wood swallow	<i>Artamus fuscus</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>

As the site geographically lies in the Western Ghats, it comes under Biome-10 (Indian Peninsula Tropical Moist Forest), according to the classification of BirdLife International (undated). However, as it does not have thick forest cover, most of the birds listed in Biome-10 are not found here. Nevertheless, the following are seen: Small Green-billed Malkoha *Phaenicophaeus viridirostris*, White-cheeked Barbet *Megalaima viridis* and Crimson-throated Barbet *Megalaima rubricapilla* (Nameer and Geroge, 1991). Sixteen species of Biome-11 (Indo-Malayan Tropical Dry Zone) are seen in this IBA.

OTHER KEY FAUNA

Chinnar Wildlife Sanctuary, along with Srivalliputtur Grizzled Giant Squirrel Sanctuary in Tamil Nadu, are two important sites of the Grizzled Giant Squirrel *Ratufa macroura* (Ramachandran 1993). A 16 km public road connecting Munnar and Udumelpettu passes more or less through the middle of the Sanctuary from Karimutty to Chinnar. Forest contiguity is broken in many places due to roads and 220 KV power lines, thus disrupting the movement of the endangered Grizzled Giant Squirrel.

Another interesting animal is the Starred Tortoise *Geochelone elegans*, an animal of the dry scrubland. It is not rare, although listed as Schedule I in the Indian Wildlife Protection Act, its presence in Chinnar is noteworthy as it is not found in other parts of Kerala.

Other important mammals found in the Sanctuary are Tiger *Panthera tigris*, Leopard *Panthera pardus*, Asian Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Cervus unicolor*, Chital *Axis axis*, Indian Giant Squirrel *Ratufa indica*, Lion-tailed Macaque *Macaca silenus*, and Bonnet Macaque *Macaca radiata*, Wild Dog *Cuon alpinus*, Wild Boar *Sus scrofa*, Indian Porcupine *Hystrix indica* and Blacknaped Hare *Lepus nigricollis*.

LAND USE

☐ Nature conservation and research

THREATS AND CONSERVATION ISSUES

☐ Grazing

☐ Firewood collection

☐ Fragmentation due to powerlines and roads

The tribal *Mudhivas* and Hill *Pulayas* had traditionally settled in the Sanctuary in ten different places. In the past, they used to depend for food on the forest alone, now they cultivate *ragi* and lemon grass. However, they still depend on the forest for some

food plants, firewood, and to graze their cattle. The local population of the neighbouring village of Marayoor also collects firewood from this area. The tribals also collect minor forest produce such as honey. Educationally and socio-economically, the tribals are very backward. Schemes have to be developed to resettle them outside the Sanctuary. They should be provided with smokeless stoves (*chulahs*) to reduce the consumption of firewood.

Fire management is a controversial issue in Chinnar. This site has scrub jungle vegetation which is maintained by occasional natural fires. However, since it was declared a Sanctuary, the Forest Department has prevented all types of fires resulting in the alteration of vegetation, definitely to an upper level of succession, but detrimental to many of the fauna, associated with the thorny scrub jungle type of vegetation (P. O. Nameer *in litt.* 2003).

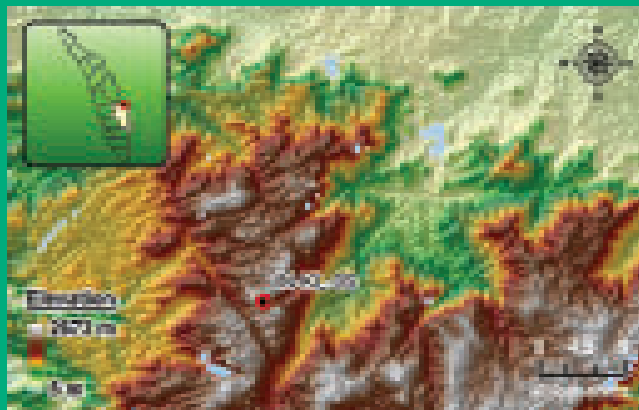
KEY CONTRIBUTOR

P. O. Nameer

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ERAVIKULAM NATIONAL PARK



IBA Site Name	: IN-KL-05
State	: Kerala
District	: Idukki
Coordinates	: 10° 15' 01"N, 77° 05' 47"E
Ownership	: State
Area	: 9,700 ha
Altitude	: 1,400 – 2,694 m
Rainfall	: 4,500 mm
Temperature	: 3 °C to 20 °C
Biogeographic Zone	: Western Ghats
Habitats	: Subtropical Broadleaf Hill Forest, Montane Grassy Slopes

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established in February 1978

GENERAL DESCRIPTION

Eravikulam National Park lies along the crest of the Western Ghats in the high ranges of Idukki district of Kerala. The nearest town, Munnar, is accessible by road from Cochin and Kottayam. Till 1975, the High Range Game Preservation Association, Munnar managed this area, when it was declared a sanctuary. In 1978, it became a National Park, mainly to protect the endemic Nilgiri Tahr *Hemitragus hylocrius*.

Eravikulam is the finest example of what remains of the *shola*-grassland ecosystem in the Western Ghats. It is also the best remaining habitat of some highly endangered and endemic mammals such as the Nilgiri Tahr and the Nilgiri Marten *Martes gwatkinsi*.

Anaimudi, at an elevation of 2,695 m is the highest peak in the Western Ghats. At the base of the Anaimudi is the Eravikulam plateau, with an average elevation of 2,000 m. It is part of a larger plateau called the High Ranges. The climate of Eravikulam and areas of similar altitude in the Western Ghats is subtropical. The wind-swept hills and rolling plateaux have grassland vegetation, and the valleys and folds harbour biologically rich forests called *sholas*. Thus the natural vegetation of the plateau is a mosaic of *sholas* and grasslands. Eravikulam is perhaps the largest contiguous, undisturbed *shola*-grassland ecosystem remaining in the Western Ghats. It is definitely the only place where one can now witness the grandeur of the mountains when, once in twelve years, whole tracts are covered by the mass flowering 'Neelakurinji' *Strobilanthes kunthianus*, "the great blue flower of Nilgiri".

About 60% of the Eravikulam National Park is under grassland. Menon (1997) identified three grassland communities based on characteristic spectral radiance value: i) *Dichanthium polyptum-Eulalia pheothrrix-Chrysopogon zeylanicus*; ii) *Arundinella mesophylla-Andropogon lividus-Ishamum indicum-Chrysopogon zeylanicus*; and iii) *Arundinella purpurea-Chrysopogon zeylanicus-Eulalia pheothrrix*.

About 25% of the Park constitutes *shola* forest, consisting of *Mesia indica*, *Microtropis ramiflora*, *Syzgium arnottianum*, *Ixora notoniana*, *Ternstroemia japonica*, *Cinnamomum wightii* and *Mahonia leschenaultii* (Menon 1997). A small percentage of West Coast Tropical Evergreen forest is also seen. About 6% is under rocks and cliffs, an important habitat of the Nilgiri Tahr.

AVIFAUNA

The Kerala Forest Research Institute recorded a total of 146 species of birds within the National Park during a survey in 1997. In a four days survey in March 1997, Uthaman (1998) recorded 92 species. Compared to some bird rich areas of Kerala, this is a low figure. The extreme climatic conditions of the high altitude plateau are a deterrent for many tropical birds. Nevertheless, Eravikulam is an important habitat of many species of birds such as the Grey-breasted Laughingthrush *Garrulax jerdoni*, the Nilgiri Flycatcher *Eumyias albicaudata*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, Nilgiri Wood-Pigeon *Columba elphinstonii* and Nilgiri Pipit *Anthus nilghiriensis* that are endemic to the Western Ghats.

There is a recent breeding record of the White-bellied Shortwing *Brachypteryx major* (C. Susanth pers. comm. 2003). Along with Grasshills and Mukurthi NP (both IBAs), Eravikulam could be a very important site for altitudinal and habitat specialists such as the Black-and-Orange Flycatcher. Uthaman (1998) and his team came across this species 13 times in four days.

This site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998) in which 16 endemic or Restricted Range species have been listed. In this site, 13 of these 16 endemics have been found. For some endemic birds, such as the Nilgiri Pipit, this is one of the most important sites in their overall distributional range.

BirdLife International (undated) has classified species that are typical of different biomes. Eravikulam, like other IBAs of the Western Ghats falls in Biome-10 (Indian Peninsula Tropical Moist Forest). Fifteen bird species are representative of this biome. At Eravikulam, nine species of this biome have been seen till now. Perhaps the remaining would also be seen if more detailed studies are conducted.

Eravikulam NP is also an important site for the winter migrants from the Himalayas and beyond. For example, Large-crowned Leaf Warbler *Phylloscopus occipitalis*, Large-billed Leaf Warbler *Phylloscopus magnirostris* and Rufous-tailed Flycatcher *Muscicapa ruficauda*, the birds of temperate forests of the Himalayas, winter here in large numbers. Similarly, Blue-headed Rock-thrush *Monticola cinclorhynchus* and Pied Thrush *Zoothera wardii* are found here in winter. Both species belong to the subtropical forest in the Himalayas.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx Major</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Near Threatened	
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Shortwing	<i>Brachypteryx Major</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Green Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Yellow-browed Bulbul	<i>Iole indica</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>

OTHER KEY FAUNA

The Nilgiri Tahr is the star attraction of the Park. Other ungulates are Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak* and Gaur *Bos gaurus*. Tiger *Panthera tigris*, Leopard *Panthera pardus* and Wild Dog *Cuon alpinus* are the major carnivores.

Erivakulam Park has a migratory population of the Asian Elephant *Elephas maximus*. Smaller carnivores include Small Indian Civet *Viverricula indica* and Jungle cats *Felis chaus*. Sloth Bear *Melursus ursinus*, Nilgiri Langur *Trachypithecus johni* and Wild Boar *Sus scrofa* are seen in the sholas and adjoining tea estates.

LAND USE

- q Nature education and conservation

THREATS AND CONSERVATION ISSUES

- q Firewood collection
- q Grazing

The major area of land around the National Park is covered with tea plantations. Private holdings are very few, and such holdings are being planted with coffee, pepper and coconut. There are no villages within the National Park. The only tribal settlement is at Lakkam near Chattamunnar. There are two villages in close proximity, Devicolam and Marayoor. The adjacent lands are

being used for the cultivation of tea, coffee, pepper and other agricultural crops.

The hill tribes stay within the National Park and are dependent on it for their livelihood. They engage in cultivating lemon grass, and collecting minor forest produce from the adjoining forest areas.

The proposed Munnar High Dam project, if implemented, would adversely affect about 50% of the population of the Nilgiri Tahr, as the tunnels of the project would pass through Rajamalai areas. The Anamalayar Dam on the Bhimamalai river of the proposed Pooyamkuttu Project also poses a direct threat to this IBA. New settlements near Anakulam and Mankulam in the west are also a threat to the IBA.

KEY CONTRIBUTORS

IBA Team and Kerala Wildlife Department

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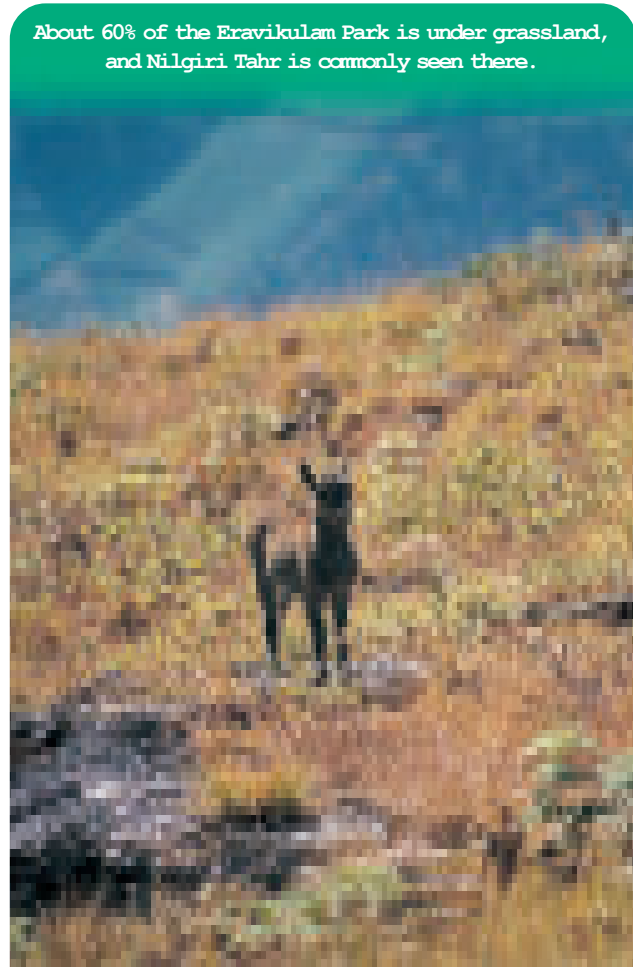
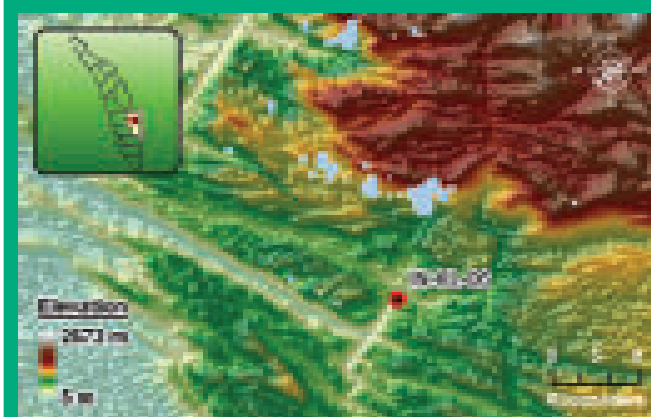


Photo: M. Zafar-ul-Islam

IDUKKI WILDLIFE SANCTUARY



IBA Site code	: IN-KL-06
State	: Kerala
District	: Idukki
Coordinates	: 9° 58' 26" N, 77° 00' 11" E
Ownership	: State
Area	: 7,000 ha
Altitude	: 450-746 m
Rainfall	: 2,200 mm
Temperature	: 13 °C to 28 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Semi-evergreen Forest, Tropical Secondary Scrub

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Wildlife Sanctuary, established in February 1976

GENERAL DESCRIPTION

The Idukki Wildlife Sanctuary, with an extent of 70 sq. km, is situated in Idukki district. The area was previously part of Kottayam Forest Division and now comes under the administrative control of the Idukki Wildlife Warden. It is situated adjacent to and south of Painavu, the district headquarters of Idukki revenue district and is 120 km north east of Kottayam. In the 1960s, the Idukki Hydroelectric Project was started and involved the construction of three dams, namely Idukki, Chemthony and Kulamavu. The Idukki reservoir spreads out to 33 sq km. In order to prevent siltation, the Government of Kerala protected the surrounding forest and established a sanctuary.

The Sanctuary is situated in the Western Ghats in Thodupuzha and Udumpanchola talukas. The lake bordering three sides of the Sanctuary offers a panoramic view. The Sanctuary consists of two sections (1) Chempakassery which was originally part of Nagarampara Range and (2) Kakkathodu Section, originally part of Ayyappancoil Range. The area of the Sanctuary falls in Nagarampara Reserve Forest and forms the catchment area of the Idukki Hydroelectric Project (Ramesan 1999-2000). The average elevation of the Sanctuary is 700 m.

The vegetation mainly consists of Moist Deciduous forest, some Tropical Wet Evergreen forests and Semi-evergreen forests and grasslands on certain hilltops. Unfortunately, the Kerala Forest Development Corporation has converted most of the grasslands into Eucalyptus plantations.

Great Pied Hornbill *Buceros bicornis* is one of the Near Threatened birds found in Idukki.

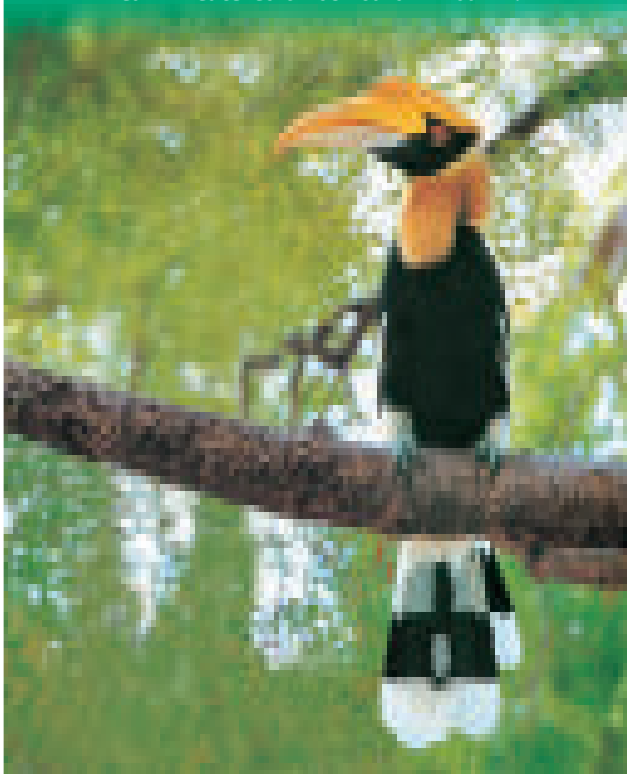


Photo: Rajat Bhargava

AVIFAUNA

219 species of birds reported from Idukki Wildlife Sanctuary (Nameer, 2000 and 2003), including 11 endemic species of Western Ghats and 5 globally threatened species.

This site is considered as Data Deficient.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elephinstonii</i>
Near Threatened	
Oriental Darter	<i>Anhinga melanogaster</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elephinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>

OTHER KEY FAUNA

A small population of less than 100 Asian Elephant *Elephas maximus* is found in this IBA. They can be seen on the banks of the reservoir along the northwestern borders (Vijaykumaran and Balasubramanyan 1985). Other mammals found in this IBA are Tiger *Panthera tigris*, Leopard *Panthera pardus*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Slender Loris *Loris lydekkerianus*, Common Giant Flying Squirrel *Petaurista*

petaurista and Sloth Bear *Melursus ursinus*. Wild Dog *Cuon alpinus* also occur in small numbers (Vijaykumaran and Balasubramanyan 1985). Bonnet Macaque *Macaca radiata* and Nilgiri Langur *Trachypithecus johni*, are the two primates. Mouse Deer *Moschiola meminna* and Pangolin *Manis crassicaudata* are also present, but they are extremely difficult to see due to their nocturnal or cryptic habits. Radhakrishnan (1999) has collected 32 species of reptiles in Idukki district, including this Sanctuary.

LAND USE

- q Nature conservation and research
- q Forestry

THREATS AND CONSERVATION ISSUES

- q Grazing
- q Afforestation
- q Firewood collection
- q Repeated burning

The southern side of the Sanctuary is covered with tea estates. Labourers mainly depend upon Vagavanom and Vanmavu area for collection of firewood for their livelihood. Their cattle enter the Sanctuary to graze. However, the damage is temporary and can be controlled easily. Permanent damage to the ecology of this forest was done during 1968-69 when three dams (Idukki, Chemthony and Kulamavu) were constructed. Not only was a vast tropical forest submerged, but also due to displacement and resettlement of hill tribals, a much larger area was affected. Moreover, during the construction of the dams, poaching of wild animals and felling of trees became rampant. Only in recent years has there been some control on poaching. Many dam workers settled in the area, further encroaching on the forestland. This is

now a political issue; no one dares to evict these illegal settlers.

Due to repeated burning of the grassland, mostly by settlers and tribals, unpalatable fire-hardy species such as *Themeda* sp. and *Cymbopogon* sp. now dominate the land (Vijaykumaran and Balasubramanyan 1985).

The Sanctuary has been under threat of encroachment, as there are a large number of settlements in and around it. People residing in these areas often enter the Sanctuary for collection of firewood. Idukki district is an industrially backward area and hence unemployment problem is acute. All these factors contribute to incidents of encroachment and illicit tree felling (Ramesan 1999-2000).

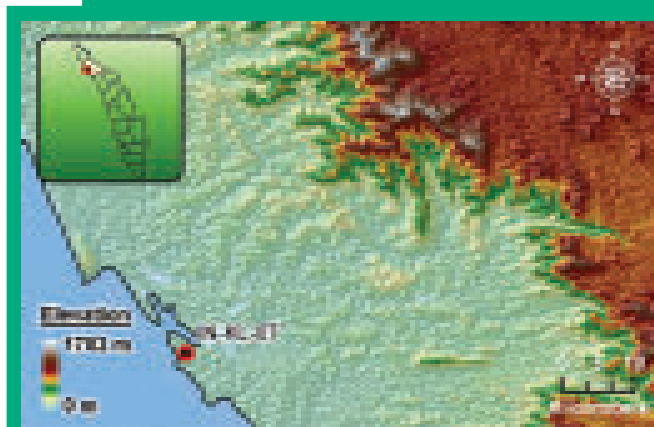
KEY CONTRIBUTOR

IBA Team

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KATTAMPALLY



IBA Site code	: IN-KL-07
State	: Kerala
District	: Kannur
Coordinates	: 11° 55' 00" N, 75° 19' 60" E
Ownership	: Private, State
Area	: 750 ha
Altitude	: 0–5 m
Rainfall	: 3,000 mm
Temperature	: 20 °C to 38 °C
Biogeographic Zone	: Coasts
Habitats	: Freshwater Swamp, Seasonal Marsh, Subtropical Secondary Scrub

IBA CRITERIA: A1 (Threatened Species)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Once a large swamp on the floodplains of the Valapattanam river with reedbeds and mangrove vegetation, Kattampally was partly converted to paddy fields and coconut plantations. But this activity wrought havoc on the traditional agricultural system that used rice varieties, which thrived in saline water and had been sustainable for centuries. Less than half of the former paddy fields are in use now. There is no tidal effect now, but the water is still saline, especially in areas near the regulator. The mangroves are all gone, but reed beds and aquatic vegetation like water lilies are present. There are considerable stretches of open water also; the noxious weed *Salvinia*, a bane to the backwater system of south Kerala has infested this wetland.

The area lies within 15 km from Kannur, the district headquarters. Not much information is available on the vegetation of this wetland, except that *Salvinia* has covered the surface.

AVIFAUNA

158 species of birds have been reported (C. Sashi Kumar *pers. comm.* 2002). This IBA site is famous for thousands of Northern Pintail *Anas acuta* and Garganey *Anas querquedula* that congregate here during winter. Since 1999, Greater Spotted Eagle *Aquila clanga*, a globally threatened species, has been observed to winter here regularly. During the winter of 2001 winter, there were two sightings of the Lesser Spotted Eagle *Aquila pomarina*, which was seen again in November 2002. Oriental Pratincole *Glareola maldivarum* has established a breeding colony here, the only one known in Kerala so far.

This wetland serves as feeding ground to several heronries, the one at Pamburuthy, an islet in the Valapattanam river, being the largest. It is a regular counting site for the Waterfowl Census organised by Asian Wetland Bureau (now Wetlands International) since 1986.

Kattampally does not fit the IBA criteria of congregations usually applied for waterfowl. But as a regular wintering area of Greater Spotted Eagle *Aquila clanga*, which is a globally threatened species, classified as Vulnerable (BirdLife International 2001), this site qualifies as an IBA under criteria A1. Further, the presence of

Lesser Spotted Eagle *Aquila pomarina*, now considered as a separate species and called Indian Spotted Eagle *Aquila hastata*, should enhance this claim.

Vulnerable

Greater Spotted Eagle	<i>Aquila clanga</i>
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OTHER KEY FAUNA

Being a wetland, the number of terrestrial mammals here is rather limited, except for a stray Golden Jackal *Canis aureus* and Common Mongoose *Herpestes edwardsi*. Otter sp. is also reported from the wetland.

LAND USE

- ☐ Agriculture
- ☐ Aquaculture/fisheries

THREATS AND CONSERVATION ISSUES

- ☐ Poaching
- ☐ Mining
- ☐ Construction of roads and transport lines
- ☐ Fishing
- ☐ Eutrophication by *Salvinia*

At present, the Kattampally wetland is totally unprotected. Its water regime has been completely disrupted due to the construction of Kattampally project. The ambitious Kattampally Project, consisting mainly of a regulator-cum-road bridge and bunds along the sides of the water channel, was commissioned in 1966, and was expected to prevent salt-water intrusion and “convert 450 ha of swamp into paddy fields”. This has played havoc with the natural water regime of the area.

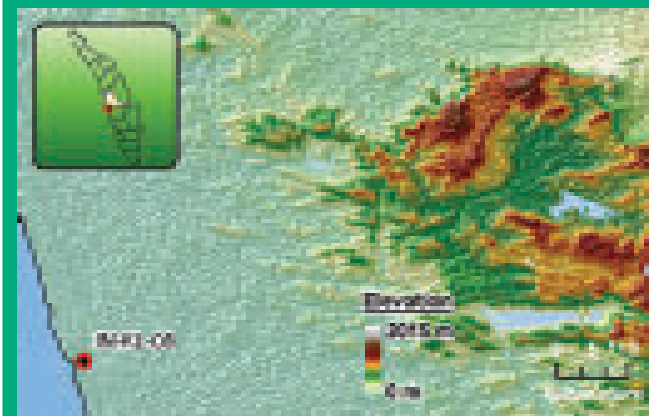
KEY CONTRIBUTOR

C. Sashi Kumar

KEY REFERENCES

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KOLE WETLANDS



IBA Site Code	: IN-KL-08
State	: Kerala
District	: Thrissur and Malappuram
Coordinates	: 10° 11' 29" N, 76° 10' 50" E
Ownership	: Private
Area	: 13,632 ha
Altitude	: 0 m
Rainfall	: 2,760 mm
Temperature	: 21 °C to 38 °C
Biogeographic Zone	: Coasts
Habitat	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The Kole wetlands, covering an area of 13,632 ha are spread over Thrissur and Malappuram districts extending from the northern bank of Chalakudy river in the south to the southern bank of Bharathapuzha river in the north (Johnkutty and Venugopal 1993). The name Kole refers to the peculiar cultivation practice carried out from December to May. "Kole", a Malayalam word, indicates a field that gives a bumper crop, so long as floods do not damage it (Nameer 2002). Rice cultivation in Kole started as early as the 18th century by reclaiming the Trichur *kayal* lands (backwaters) by erecting temporary earthen bunds. The water pumped out from the field is stored in a network of canals in the area. The Kole areas are low-lying and have a central, narrow strip covering a long expanse, with many pockets running into cultivated land on either side. The region is naturally subject to salt-water ingress. During the monsoon, the entire region, which gets submerged under water, is cultivated by draining the water and by erecting bunds. Regulators are provided at certain strategic points to prevent the intrusion of salt water into the Kole wetlands during the cultivation period.

Grasses and sedges are found in shallow and drier zones. The main activity in and around Kole is paddy cultivation. As Kole is a large sprawling wetland, with human habitation all around, there are coconut and arecanut plantations, gardens and cultivated plants.

AVIFAUNA

A total of 182 bird species has been recorded from the Kole wetlands, of which 53 are winter visitors (Sivaperuman and Jayson 2000, Nameer 1994, Nameer 2002, Jayson 2002). The importance of these wetlands can be judged from the fact that between March 1988 and May 2001, Nameer (2002) recorded 21 bird species not recorded by Ali (1969). Of these, seven species i.e. Eurasian Spoonbill *Platalea leucorodia*, Comb Duck *Sarkidiornis melanotos*, White-tailed Lapwing *Vanellus leucurus*, Grey-headed Lapwing *Vanellus cinereus*, Plain Sand Martin *Riparia paludicola*, Common Starling *Sturnus vulgaris* and Red Munia *Estrilda amandava* were recorded for the first time in Kerala (Nameer 2002).

Kole wetland has been monitored by an organization called Nature Education Society, Trichur (NEST) (Nameer 1993). In 1992, NEST recorded 23,605 birds, including 50 species of waterbirds and four raptors (Jayson 2002). Next year, 54,000 birds, including 48 species of wetland birds were recorded (Nameer 1993).

Kole wetlands may have the largest roost of terns in India. Nameer (2002) estimated about 25,000, including 10,000 Whiskered Terns *Chlidonias hybridus*. According to Wetlands International (2002), 1% population threshold of Whiskered Tern in India is 1,000. Therefore, almost 10% of the population of this species congregates at Kole wetland. Other species seen above their 1% biogeographic population threshold are (number seen at Kole given in brackets): Garganey *Anas querquedula* (7,887), Little Egret *Egretta garzetta* (5,000) and Gull-billed Tern *Gelochelidon nilotica* (3,365).

Sivaperuman and Jayson (2000) have reported Rufous Babbler *Turdoides subrufus*, a Western Ghats endemics found in tall grass and bamboo at the edge of forests (Grimmett *et al.* 1998).

Kole wetland is selected as an IBA as it perfectly fits three criteria: A1: it has many globally Threatened and Near Threatened species; A4i: it has ≥1% of the biogeographic population of Indian Whiskered Tern, Garganey and Gull-billed Tern, and A4iii: it has ≥20,000 waterbirds.

Vulnerable	
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Greater Spotted Eagle	<i>Aquila clanga</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

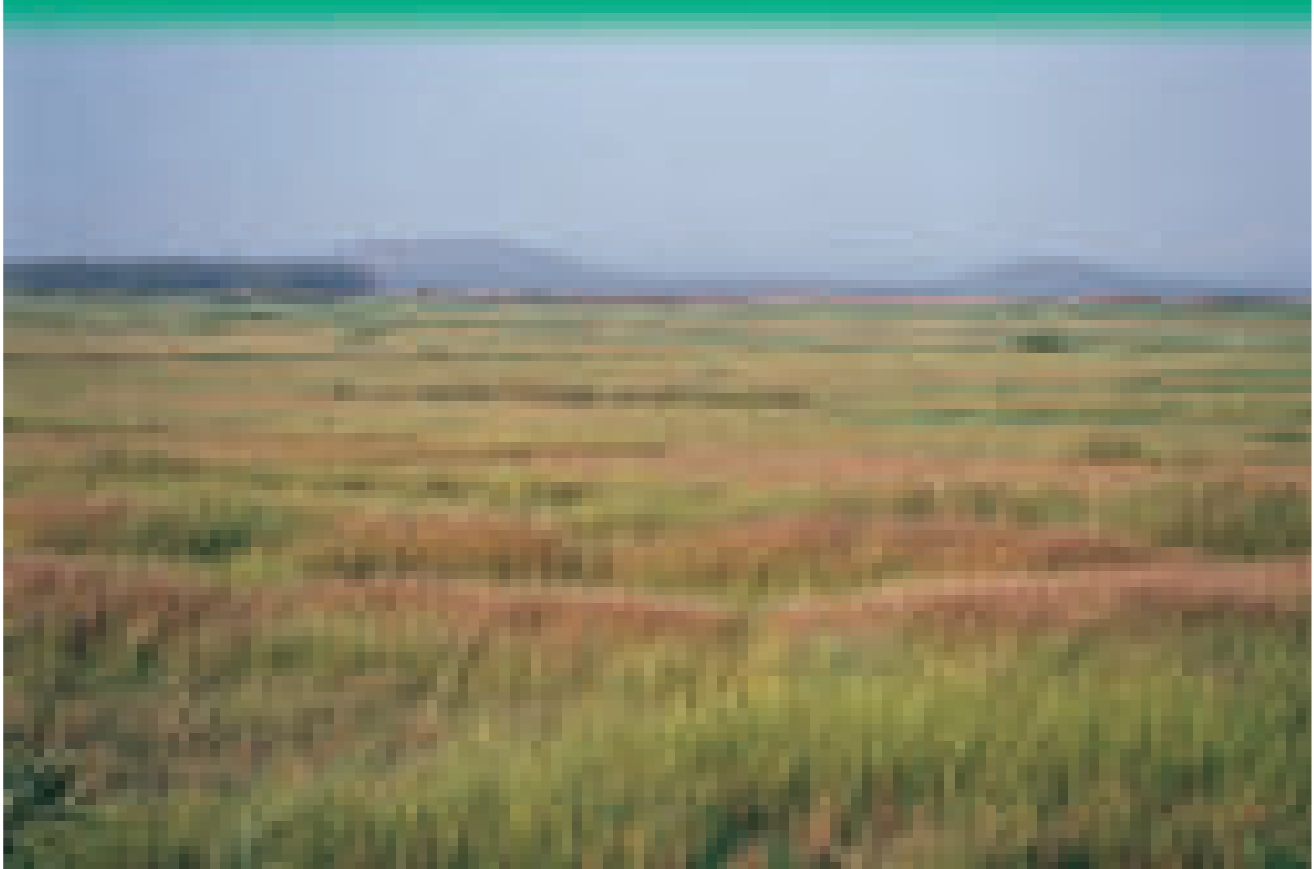
OTHER KEY FAUNA

Data on other fauna are not available.

LAND USE

- q Agriculture
- q Water management

Kole wetlands attract thousands of waterbirds during winter months.



THREATS AND CONSERVATION ISSUES

- ☐ Drainage
- ☐ Dredging and canalization
- ☐ Agricultural expansion and excessive exploitation of groundwater

Kole is one of the largest and most important wetlands of Kerala. It is also one of the most threatened wetlands in the State. Reclamation of land and change in land use pattern are the most serious problems. Paddy fields are being converted to coconut, arecanut and banana plantations and other cash crops at an alarming rate. The marshes are being 'developed' and new constructions are cropping up. At many places, the wetland has been converted to brick-kilns, which has become a profitable small-scale industry. Added to this are, large scale poaching and trapping of birds and fish. Of the 12 Spot-billed Pelicans seen on January 15, 1993 by Nameer (1993), two were killed by poachers.

The indiscriminate use of pesticides affects the bird population. Pesticides are also used to poison and capture birds for meat. Apart from this, setting fire to the natural vegetation in the area also adversely affects the breeding habitats of Rallidae, Sylviinae, Ploceinae and Estrildinae.

As a very large number of people live in and directly benefit from Kole wetland, there is a great opportunity to develop it into a multiple-use wetland under the Ramsar Convention.

KEY CONTRIBUTOR

P. O. Nameer

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KONNI RESERVE FOREST



IBA Site Code	: IN-KL-09
State	: Kerala
District	: Kollam and Pathanamthitta
Coordinates	: 9° 03' 00" N, 76° 53' 30" E
Ownership	: State
Area	: 33,116 ha
Altitude	: 60 - 997 m
Rainfall	: 2,210 - 3,640 mm
Temperature	: 12 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: West Coast Tropical Evergreen, West Coast Semi-evergreen and Southern Moist Mixed Deciduous Forest and Grasslands

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Konni Reserve Forest (RF), in Karunagappally and Pathanapuram talukas of Kollam district and portions of Kozhencherry and Adoor talukas of Pathanamthitta district lies on the western slopes of the Western Ghats. Therefore, it receives heavy rainfall, resulting in Tropical Evergreen and Semi-evergreen forests. Three major rivers and many rivulets originate in Konni RF. The Forest area of the Division has a hilly terrain, the main hills being Chelikkalkar (997 m), Kodamala (598 m), Thunathumala (721 m) and Iruvullimala (817 m). The numerous ridges and valleys do not have a definite pattern, but on the whole, the area has a north to south aspect.

The climate in the hills is more pleasant than that of the plains. The temperature varies from 11 °C to 35 °C. From January to May it is dry and hot, March and April are the hottest months. Wet season is from June to November, sometimes with a short break in September. Heavy to very heavy rains are experienced in June-July.

The forest of Konni Forest Division is composed of different forest types, mainly due to the influence of elevation, rainfall and temperature. Most parts of Konni are covered with close canopy forests, with some lofty evergreen trees above the canopy. Epiphytes, mosses and orchids grow on these trees, especially in valleys. Due to the dense canopy, ground vegetation is absent in places, but stretches of *Strobilanthus* and ferns may occur. Most of the low-lying areas have been converted into teak plantations (about 8,300 ha).

AVIFAUNA

Although no detailed study on the biodiversity has been done in Konni RF, it is likely to have many Western Ghats endemics, such as the Malabar Grey Hornbill *Ocyrceros griseus*, the Nilgiri Wood-Pigeon *Columba elphinstonii*, the White-bellied Treepie *Dendrocitta leucogastra* and the White-cheeked Barbet *Megalaima viridis*. It also has a good population of Large Pied or Great Hornbill *Buceros bicornis*.

Konni RF falls in Biome-10 (Indian Peninsula Tropical Moist Forest) and should have most of the species found in this Biome.

This Reserve Forest has been included in the IBA list mainly because it still has very good forest cover and must be having rich bird life. There is an urgent need to survey and document the bird fauna of this IBA.

Vulnerable

Nilgiri Wood-Pigeon *Columba elphinstonii*

Endemic Bird Area 123: Western Ghats

Nilgiri Wood-Pigeon *Columba elphinstonii*

OTHER KEY FAUNA

Konni RF is rich in wildlife. The Tiger *Panthera tigris* has been reported from many parts, but mainly in Thora and Attippara areas near Kokkathodu. The Asian Elephant *Elephas maximus* is mainly seen in Naduvathumuzhi and Konni ranges. Other fauna includes Leopard *Panthera pardus*, Wild Dog *Cuon alpinus*, Barking Deer *Muntiacus muntjak*, Sambar *Cervus unicolor*, Mouse Deer *Moschiola meminna*, Sloth Bear *Melursus ursinus*, Nilgiri Langur *Trachypithecus johni*, Common Langur *Semnopithecus entellus*, Small Travancore Flying Squirrel *Petinomys fuscocapillus* and Indian Giant Squirrel *Ratufa indica*.

LAND USE

- q Forestry operations
- q Plantations

THREATS AND CONSERVATION ISSUES

- q Plantation
- q Poaching

Konni RF has suffered logging for more than 150 years. Facility for water transport and availability of good quality timber have led to over-exploitation, but this has been brought under control in recent years. However, large tracts of former lowland tropical rain forests now consist of teak plantations. Some of these plantations are mature and need to be removed. Once this is done, there would be an opportunity to regenerate back the natural tropical forest.

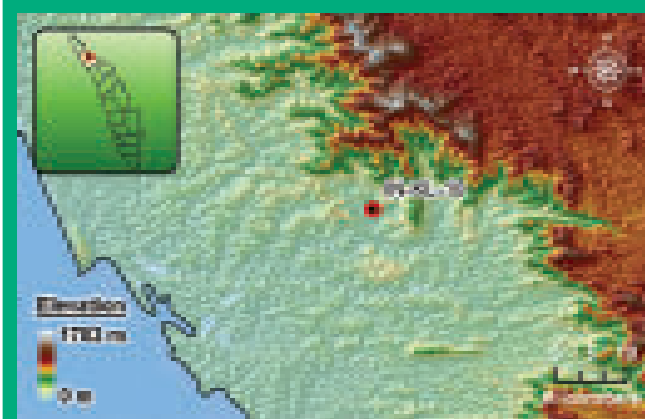
KEY CONTRIBUTOR

Forest Department, Kerala

KEY REFERENCE

Not available

KOTTIYOOR RESERVE FOREST



IBA Site Code	: IN-KL-10
State	: Kerala
District	: Kannur
Coordinates	: 12° 05' 08" N, 75° 34' 32" E
Ownership	: State
Area	: 3,500 ha
Altitude	: 70–1,361 m
Rainfall	: 3,000 mm
Temperature	: 15 °C to 38 °C
Biogeographic Zone	: Western Ghats
Habitats	: West Coast Tropical Evergreen and Semi-evergreen Forests

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Situated on the western slopes of the Brahmagiri, Kottiyoor Reserve Forest is adjacent to the Aralam Wildlife Sanctuary. Though bounded by the contiguous forests of Aralam and Hilldale RF on the east, northeast and northwest sides, the south and southwest sides of this forest are bordered by thickly populated villages. The main forest types are West Coast Tropical Evergreen and West Coast Tropical Semi-evergreen. A significant extent of this area is covered by grassland at altitudes ranging from 900 to 1,361 m. A small part of the reserve forest has been converted to teak plantation. This forest had been heavily worked on by selective felling until the early 1970s. The area is well watered, with several perennial streams running into Bavali Puzha, a tributary of Valappattanam River.

AVIFAUNA

A total of 168 birds belonging to 43 families was recorded (Sashikumar 2002). This includes one globally threatened species, Broad-tailed Grass-Warbler *Schoenicola platyura*. Another globally threatened species likely to occur here is the Nilgiri Wood-Pigeon *Columba elphinstonii* because the habitat is quite suitable for this forest loving pigeon.

The site lies in the Western Ghats Endemic Bird Area, where Stattersfield *et al.* (1998) have identified 16 restricted range or endemic species. As this site has good forest cover, and it also adjoins other protected areas, 10 endemic species have been identified. One or two more are likely to be found here, once detailed studies are conducted.

This site is also suitable for biome restricted assemblages. One of the criteria for the identification of an IBA is that the site is known or thought to hold, a significant component of a group of species whose distributions are largely or wholly confined to one biome. This site falls in the Biome-10 (Indian Peninsula Tropical Moist Forest), where BirdLife International (undated) has listed 15 bird species. Twelve of these 15 biome restricted species are found in Kottiyoor Reserve Forest (Sashikumar 2002), which further proves the importance of this site as an IBA.

The site also holds significant population of Near Threatened Malabar Pied Hornbill *Anthracoeros coronatus*. This species has seen rapid decline in Sri Lanka, and similar losses are occurring in India (BirdLife International 2001).

Vulnerable	
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Near Threatened	
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Endemic Bird Area 123: Western Ghats	
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyroceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Jerdon's Nightjar	<i>Caprimulgus atripennis</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Yellow-browed Bulbul	<i>Iole indica</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

Kottiyoor and the surrounding reserve forests harbour a number of Asian Elephant *Elephas maximus*. Gaur *Bos gaurus*, Sambar *Cervus unicolor* and Barking Deer *Muntiacus muntjak* are the main herbivores. Tiger *Panthera tigris* and Leopard *Panthera pardus* are the major carnivores reported from the site. No study on wildlife has been done in this IBA site.

LAND USE

- q Forestry

THREATS AND CONSERVATION ISSUES

- q Burning of grasslands
- q Poaching
- q Unrestricted collection of minor forest produce
- q Firewood collection

The presence of vast grasslands, an ecosystem absent from the adjacent Aralam WLS, gives Kottiyoor RF great conservation value. The globally threatened Broad-tailed Grass-Warbler or Grassbird and the endemic Nilgiri Pipit *Anthus nilghiriensis* are typical inhabitants of these grasslands.

Nair (1991) identified this reserve forest as an important site for long-term conservation of the mega-vertebrates such as the Asian Elephant and the Tiger. It is also a prime bird habitat.

This forest forms the watershed area of Bavali Puzha, thereby contributing to the water resources of Kannur district. It is necessary that this reserve forest be elevated to protected area status by being added to the Aralam WLS.

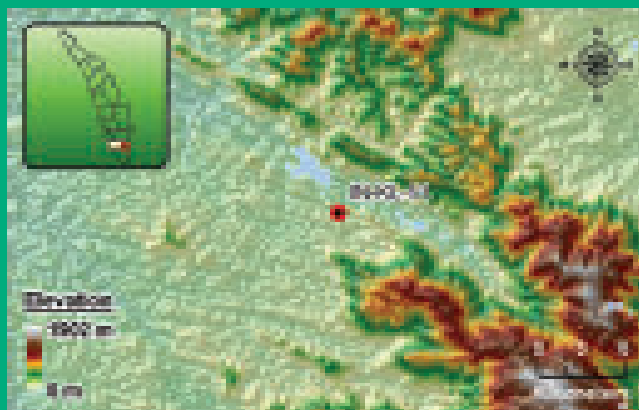
KEY CONTRIBUTOR

C. Sashikumar

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KULATHUPUZHA RESERVE FOREST



IBA Site code	: IN-KL-11
State	: Kerala
District	: Kollam
Coordinates	: 08° 54' 54" N, 77° 05' 60" E
Ownership	: State
Area	: 21,900 ha
Altitude	: 500 m
Rainfall	: 3,200 mm
Temperature	: 16 °C to 32 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen Forest, West Coast Semi-evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The Kulathupuzha Reserve forest lies between Chenduruni Wildlife Sanctuary and Agasthyarkoodam (Ponmudi hills). The IBA lies in two revenue districts namely Kollam and Thiruvananthapuram. The nearest railway station is Kollam, about 70 km away from Kulathupuzha town. The area is connected by Thiruvananthapuram Shenkottah road and Kollam Kulathupuzha road.

Kulathupuzha Reserve Forest and adjoining ranges of plantations (Teak) and mixed forests (Evergreen, Semi-evergreen and Moist Deciduous Forests) host a good floral and faunal diversity. *Anacolosa densiflora*, *Artocarpus heterophyllus*, *Alianthus malabarica*, *Artocarpus hirsuta*, *Calophyllum elatum*, *Canarium strictum* and *Gluta travancorica* are the interesting tree species of this IBA site. Thick reed brakes cover long stretches on the southwestern slopes of Pandimottai, including Pongumala, in Kulathupuzha Range.

The unique *Myristica* swamp forest is found at Vencolla, Amakkulam and Sasthannada region. This type of forest is seen in tropical evergreen forests below 300 m especially along the bottom of the valley, which is subject to inundation throughout

the year due to heavy rainfall. The whole valley floor is often covered with protruding roots of *Myristica*. Kulathupuzha river catchment area bears some of the most pristine forests now existing in the state.

AVIFAUNA

A total of 215 species of birds was recorded by P. Manoj in 2001-2002. More than 20% of the total species are migrants, while the rest are local migrants and residents.

The globally threatened Nilgiri Wood-Pigeon *Columba elphinstonii* occurs in this site, especially in Pandimotta region.

Kulathupuzha lies in the Western Ghats Endemic Bird Area, where Stattersfield *et al.* (1998) have identified 16 Restricted Range or endemic species. Of these, 12 endemic species have been recorded in this site, which shows that the natural forest cover is still intact.

Kulathupuzha is a host to 12 endemic bird species, including the Nilgiri Flycatcher *Eumyias albicaudata*.



Photo: Clement Francis M.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Near Threatened	
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyroceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>

OTHER KEY FAUNA

Kulathupuzha Reserve Forest has most of the representative mammals found in the Western Ghats, including the endemic Nilgiri Langur *Trachypithecus johni*. Asian Elephant *Elephas maximus*, Guar *Bos frontalis*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Tiger *Panthera tigris*, Leopard *P. pardus* and Sloth Bear *Melursus ursinus* are known to occur. The Wild Dog *Cuon alpinus* is likely to occur.

LAND USE

- q Plantations
- q Forestry operations

THREATS AND CONSERVATION ISSUES

- q Human settlements
- q Tree felling
- q Forest fire
- q Poaching
- q Grazing of livestock

There are many settlements in the reserve forest, including those of tribals. Owing to anthropogenic pressure, there is constant and permanent ecological degradation of the natural habitats which affects the flora and fauna. Cattle grazing and commercial forestry also contribute to the degradation. Forest fires during the hot, dry summer in the core area is a constant menace.

Poaching of birds is very common in the fringe areas of the forests like Thalappacha, Amakkulam, Mylamood and Chozhiakode.

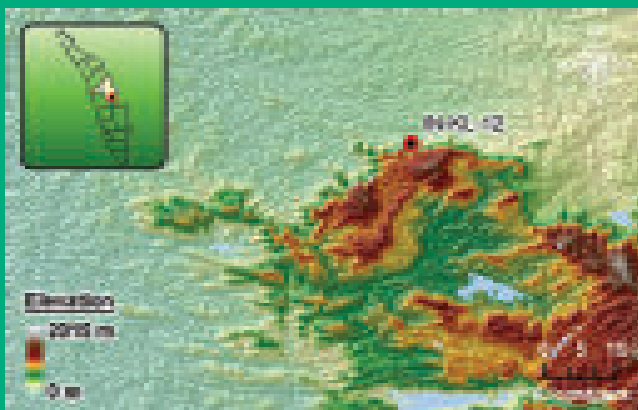
KEY CONTRIBUTOR

P. Manoj

KEY REFERENCE

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.

NELLIYAMPATHY (NEMMARA DIVISION)



IBA Site code	: IN-KL-12
State	: Kerala
District	: Palghat
Coordinates	: 10° 34' 00" N, 76° 42' 30" E
Ownership	: State
Area	: 20,005 ha
Altitude	: c. 1,050 m
Rainfall	: 3,400 mm
Temperature	: 15 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The Nelliampathy Hills start from the southern and southwestern margin of the Palakkad Gap and extend south, enclosing the Parambikulam basin. The western edge of the Nelliampathy gradually descends to the midlands of Thrissur district through a wide foothill zone drained by Puzhachal and Karuvannur. Topographically, the entire area is hilly in character. The Kuriarkutty river is formed by the confluence of Thekkady river originating from the private forests of Thekkady and Vettiar flowing from the Nelliampathy forest. The Karapara river also originates from the Nelliampathy range and joins other rivers to form the main Chalakudy river.

The Tropical Evergreen Forest of the Nelliampathy Range comprises of the tree species such as *Palaquium ellipticum*, *Cullenia exarilata*, *Mesua ferrea* and *Drypetes wightii*.

AVIFAUNA

109 species of the birds are reported from Nelliampathy (Prasad and Vijayan 2002). Globally threatened Nilgiri Wood-Pigeon *Columba elphinstonii* is found here but it is not common. Even Kinloch (1921) during 1910 to 1920 found it sparse. Zacharias and Gaston (1999) also found it uncommon.

This site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998) in which 16 endemic or Restricted Range species have been listed. In this IBA, 12 of these 16 endemics have been found.

Broad-tailed Grass-Warbler or Grassbird *Schoenicola platyura* is listed as Vulnerable by BirdLife International (2001). It is one of the four threatened members of the suite of 16 bird species that are entirely restricted to the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998). In the Western Ghats, shola grassland areas are heavily overgrazed and this is the major concern for this species and the Near Threatened Nilgiri Pipit *Anthus nilghiriensis*. The Broad-tailed Grass-Warbler, in particular, frequents tall grass (BirdLife International 2001). J. Praveen (*in litt.* 2003) saw 4-5 birds in a grassland, flitting among the grass, one was delivering a lark-like warbling song, perched on a rock.

Tytlar's Leaf Warbler *Phylloscopus tytleri* breeds in the Himalayas and winters in the Western Ghats (Ali and Ripley 1987, Grimmett *et al.* 1998). J. Praveen (*in litt.* 2003) found it common in Nelliampathy.

Vulnerable

Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>

Near Threatened

Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>

Endemic Bird Areas 123: Western Ghats

Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>

OTHER KEY FAUNA

Lion-tailed Macaque, Tiger, Nilgiri Langur, Nilgiri Tahr, Gaur, Sambar, Giant Squirrel are some of the species commonly seen here.

LAND USE

- ☐ Plantation
- ☐ Agriculture

THREATS AND CONSERVATION ISSUES

- ☐ Agriculture
- ☐ Plantation (Monoculture)
- ☐ Construction
- ☐ Plywood industry

According to Chadrashkara *et al.* (2002), a substantial portion of this forest has been encroached and cleared for agriculture, construction of hydroelectric projects and raising monoculture plantations of hill produce like cardamom, coffee, tea, teak and rubber.

Mathew *et al.* (2002) have also found that the establishment of agricultural plantations of coffee, cardamom and tea are the major disturbance at Nelliampathy. According to their investigations, out of 20,005 ha area of this forest, 3,956 ha of land is leased out to private agencies for such plantation programmes. In order to provide partial shade to the crops, the trees and the understorey vegetation in the leased forestlands have been selectively removed. The most important conservation strategy for Nelliampathy is the restoration of the altered habitats.

According to Prasad and Vijayan (2002), Nelliampathy, with its high conservation value, needs to be considered for addition to the Parambikulam Wildlife Sanctuary.

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J. Praveen and P. O. Nameer

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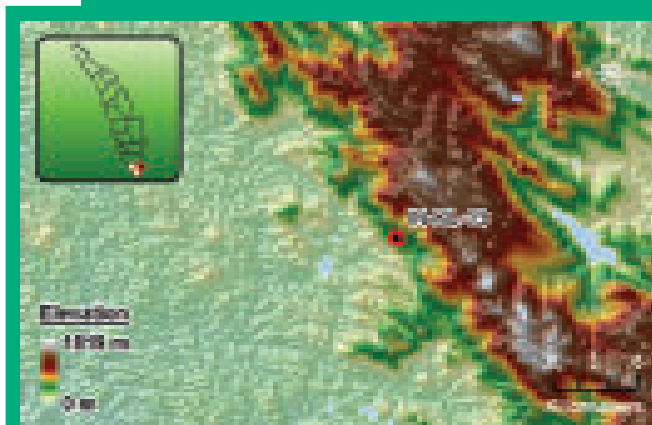
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NEYYAR WILDLIFE SANCTUARY



IBA Site code	: IN-KL-13
State	: Kerala
District	: Thiruvananthapuram
Coordinates	: 8° 38' 38" N, 77° 11' 20" E
Ownership	: State
Area	: 12,800 ha
Altitude	: 90 - 1,858 m
Rainfall	: 2,800 mm
Temperature	: 16 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen, Tropical Semi-evergreen, Tropical Moist deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Areas 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in March 1971

GENERAL DESCRIPTION

This IBA is located on the western slopes of the Western Ghats, along the southeast corner of Kerala in Neyyattinkara taluka of Thiruvananthapuram district. The Sanctuary forms the catchment area of the Neyyar reservoir built in 1958. The reservoir has numerous creeks and islets, forming ideal habitats for birds. The forest is more or less contiguous with a vast stretch of reserve forests: Kottoor Reserve Forest (IBA) in the north, revenue land in the south and west and Kalakkad-Mundathurai Sanctuary (IBA) of Tamil Nadu. The climate in the Sanctuary is moderately hot and humid with a low range of temperature. The high hills are cooler and drier than the foothills and valleys. Due to the varied climatic and topographic conditions, the Sanctuary harbours a remarkable diversity of vegetation.

This IBA has West Coast Tropical Evergreen type vegetation mainly seen in Thalamuttiappy and Sooryanthanakuzhi; Southern Hilltop Tropical Evergreen, found above 1,000 m on the top of hills and in sholas; West Coast Semi-evergreen, mainly seen on the banks of the major rivers and streams and Southern Moist Mixed Deciduous forests over more than 60% of the tract along the lower slopes of hills. Jain and Sastry (1983) have studied the vegetation of this Sanctuary. They suggest that much of the Moist

Deciduous Forest may have resulted from degradation of the original evergreen forest. The Sanctuary has several rare, endemic medicinal plants (Henry *et al.* 1984) such as *Bentinckia conddapanna*, *Poeciloneuron pauciflorum*, *Eugenia floccosa*, *Eugenia discifera*, *Ardisia missionis*, *Hetaeria ovalifolia* and *Chiloschista glandulosa*.

AVIFAUNA

More than 172 species of birds have been reported from Neyyar Wildlife Sanctuary (Nair 1993) but this is only an indicative list and not a complete list. If detailed investigation is conducted, with mist netting for identification of difficult warbler species, this checklist would probably increase by another hundred species. Nair (1993) once found 18 species of birds feeding on a *Ficus* tree, giving a glimpse of the avian diversity of this site. Agasthyakoodam peak and its immediate environs are particularly rich in avifauna.

Neyyar Wildlife Sanctuary has its usual complement of threatened, restricted range and biome species, like in other similar forests of Kerala.

Sixteen species of birds are endemic to the Western Ghats (Ali and Ripley 1987). Stattersfield *et al.* (1998) have called them restricted range because their historical range is probably less than 50,000 sq. km. In Neyyar, 11 of these restricted range species are found, including the globally threatened Nilgiri Wood-Pigeon. Three of these species are also considered Near Threatened (BirdLife International 2001). Besides these species, two more Near Threatened species are found at this site: Greater Grey-headed Fish-eagle *Ichthyophaga ichthyaetus* and Great Pied Hornbill *Buceros bicornis*.

BirdLife International (undated) has also categorized birds according to biome assemblages. Neyyar lies in Biome-10 (Indian Peninsula Tropical Moist Forest). Fifteen species are recognized as representative of this biome-assemblage. Five are seen in this area, but more are likely to be found if detailed investigation is done. The biome species are generally not rare and are quite well-spread in a particular biome.

This site has been selected as an IBA as it fits three criteria: A1 (Threatened species), A2 (Restricted Range or endemic species) and A3 (Biome-restricted assemblages).

The forests of Neyyar WLS supports more than 172 species of birds.

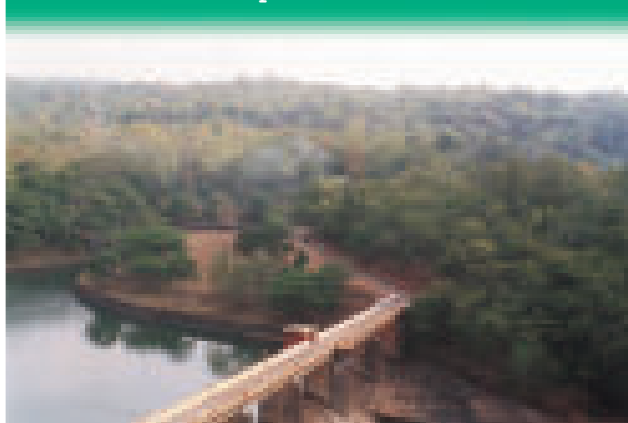


Photo: M. Zafer-ul-Islam

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Near Threatened	
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Nilgiri Pipit (?)	<i>Anthus nilghiriensis</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Nilgiri Pipit (?)	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>

OTHER KEY FAUNA

The Sanctuary has a variety of animals. The evergreen forests, contiguous with the adjoining protected areas of Tamil Nadu, support viable populations of the endangered Lion-tailed Macaque *Macaca silenus* and Nilgiri Langur *Trachypithecus johni*. Other arboreals include Bonnet Macaque *Macaca radiata* and Indian Giant Squirrel *Ratufa indica*. The Nilgiri Tahr *Hemitragus hylocrius* is also seen in the higher peaks of the area. The Asian Elephant *Elephas maximus* and Sambar *Cervus unicolor* are the most commonly seen animals. Gaur *Bos gaurus*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna*, Sloth Bear *Melursus ursinus*, Toddy Cat *Paradoxurus hermaphroditus*, Otter sp., Dhole *Cuon alpinus*, Golden Jackal *Canis aureus*, Slender Loris *Loris lydekkerianus*, Chinese Pangolin *Manis pentadactyla* and Wild Boar *Sus scrofa* are regularly sighted. Tiger *Panthera tigris* and Leopard *P. pardus* are also reported from the Sanctuary.

LAND USE

- ☐ Agriculture
- ☐ Socio-economic
- ☐ Ecotourism

THREATS AND CONSERVATION ISSUES

- ☐ Collection of firewood and other resources
- ☐ Tourism and recreation
- ☐ Grazing
- ☐ Agriculture
- ☐ Forest fires

The Sanctuary encompasses the catchment area of the Neyyar Dam, which is part of an irrigation scheme for Kerala and Tamil Nadu. Its suitability for nomination as a biosphere reserve has been assessed (Henry *et al.* 1984). A very large number of people have settled in and around the Sanctuary, especially in the southern catchment area of Neyyar reservoir. Both hill tribes and settlers put tremendous pressure by cattle grazing, illicit felling of trees, removal of minor forest produce and by starting fires. The pressure of pilgrims to Agasthiyar Peak puts additional pressure on the biotic resources. Till now, the full impact of the creation of Neyyar reservoir on the wildlife has not been studied.

As Neyyar is scenically and biologically very rich, it could be developed into a major tourist destination. However, this should be done with careful planning, so additional pressure is not put on the resources. It is also a fine place to see Western Ghats endemics plants, mammals, reptiles and birds.

KEY CONTRIBUTOR

Manoj Nair

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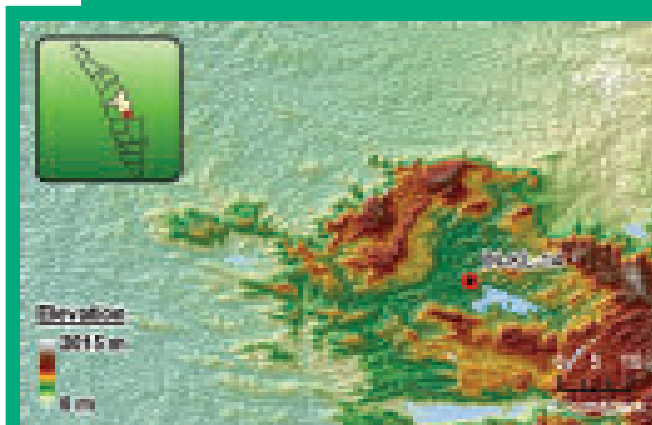
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PARAMBIKULAM WILDLIFE SANCTUARY



IBA Site code	: IN-KL-14
State	: Kerala
District	: Palghat
Coordinates	: 10° 24' 38" N, 76° 45' 51" E
Ownership	: State
Area	: 28,500 ha
Altitude	: 500 – 1,444 m
Rainfall	: 1,732 mm
Temperature	: 20 °C to 33 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous, Tropical Dry Deciduous Forests

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in November 1984

GENERAL DESCRIPTION

Parambikulam Wildlife Sanctuary in the Palghat district of Kerala, came into existence in 1962 when an area of 69.8 sq. km of the Sungam Range of Nemmara Forest Division was declared as a Sanctuary. Parambikulam Range of the Division of Teak Plantation was added to this in 1973, and final notification was done in 1984. At present, the area is about 235 sq. km. The Parambikulam WLS is adjacent to Indira Gandhi Wildlife Sanctuary (IBA) in Tamil Nadu, Nelliampathy (=Nellyampathy) Reserve Forests (IBA) of Nemmara Forest Division to the northwest, and the Vazhachal and Sholayar ranges to the southwest and south respectively (Vijayan 1979). It is part of a large area of forest comprising Anamalai, Nelliampathi, Sholayar High ranges and Palani Hills.

The area in general slopes towards the west, the highest peak being Karimala Gopuram (1,418 m) (triangulation station of the Survey of India), while the lowest area is 433 m above msl on the bank of Chalakudi.

Inside the Sanctuary area, three dams of the Parambikulam Aliyar Project were constructed in 1960 for irrigation and power generation, and are still under the administrative control of the Tamil Nadu State Government.

The vegetation comprises of a variety of natural and man-made habitats. The former includes patches of Evergreen and Semi-evergreen forest, Secondary Moist Deciduous forest, which is widely distributed, and grasslands and marshes. The original Moist Deciduous vegetation in the eastern parts has been almost entirely replaced by teak plantations (Anon. 1982). The marshes, or vayals, with their dense grass cover, are the result of poor drainage and the accumulation of clayey loam over a long period of time. Stands of Bamboo *Bambusa* sp. and reeds *Ochlandra* sp. occur in the natural forests. The best natural Teak *Tectona grandis* in Kerala was once found in this region but is now rare due to over-exploitation. The major species occurring in the Evergreen and Moist Deciduous forests are listed in Balakrishnan and Easa (1986) and Vijayan (1979). There is thick growth of *Lantana camara* in clearings, and of *Eupatorium* sp. in teak plantations, particularly where the plantations have failed.

AVIFAUNA

R. Sugathan (*pers. comm.* 2001) is conducting long-term study on the birds of Parambikulam Wildlife Sanctuary. About 131 species

of birds have been identified, including some threatened and restricted range species.

214 bird species recorded from Parambikulam Wildlife Sanctuary (Nameer 1994) including some of the globally threatened species.

The site lies in the Western Ghats Endemic Bird Area (EBA) (Stattersfield *et al.* 1998). In this EBA, 16 species have been identified which have restricted range of less than 50,000 sq. km. Most of them are forest birds. Five of these restricted range species are known from this site. Probably more restricted range species are found as the forest cover is extensive, and this site adjoins other IBAs where these species are found.

Based on the biome classification of BirdLife International (undated), this site should fall in Biome-10 (Indian Peninsula Tropical Moist Forest). Out of the 15 species of this biome-restricted assemblage, eight have been found at Parambikulam till now. More are likely to occur as they are common in the Western Ghats. Detailed avifaunal investigation is required.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Broad-tailed Grassbird	<i>Schoenicola platyura</i>
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Small Sunbird	<i>Nectarinia minima</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

Three dams constructed inside the Sanctuary are still in the administrative control of the Tamil Nadu Irrigation Department.

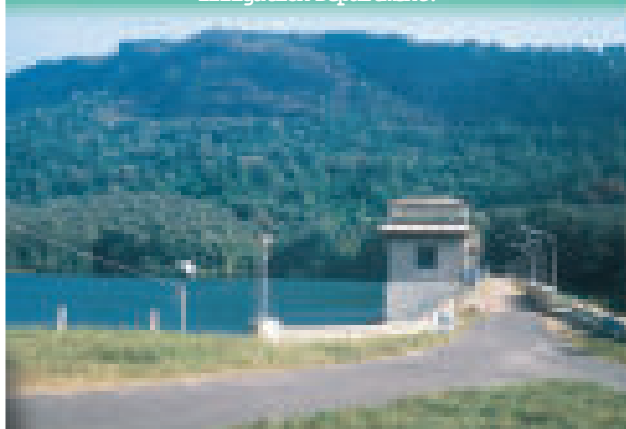


Photo: M. Zafar-ul-Islam

OTHER KEY FAUNA

The Sanctuary harbours almost all representatives of the larger species of peninsular Indian mammals. Major carnivores include the Tiger *Panthera tigris*, Leopard *P. pardus* and Indian Wild Dog *Cuon alpinus*. Large herds of Asian Elephant *Elephas maximus* are often seen. Herbivores are represented by Gaur *Bos gaurus*, Sambar *Cervus unicolor*, Chital *Axis axis* and Muntjak *Muntiacus muntjak*. There are reports of Mouse Deer *Moschiola meminna*. All the four non-human primates found in Kerala are present in Parambikulam: Bonnet Macaque *Macaca radiata*, Lion-tailed Macaque *M. silenus*, Nilgiri Langur *Trachypithecus johni* and Common Langur *T. entellus*. Sloth Bear *Melursus ursinus* is quite common. Parambikulam is perhaps the best site to see large herds of Gaur in peninsular India. A small herd of 15-25 Nilgiri Tahr *Hemitragus hylocrius* is found on Vengoli-Pamban Malai (Balakrishnan and Easa 1986; Mishra and Johnsingh 1994).

LAND USE

- ☐ Nature conservation and research
- ☐ Tourism

THREATS AND CONSERVATION ISSUES

- ☐ Tourism and recreation
- ☐ Grazing
- ☐ Fuel wood collection
- ☐ Human habitation
- ☐ Invasive species (*Tilapia*)

This IBA site suffers from a plethora of problems, all related to human activities. Easa and Balakrishnan (1983) have discussed conservation problems in great detail. According to them, cattle grazing in certain areas is a perennial problem, and is increasing due to human settlements. Related to this is the fire during summer

months. This is leading to spread of weeds and fire-resistant non-palatable species. This problem needs detailed study. Perhaps rotational burning, which establishes a mosaic of burnt and unburnt grasslands during the dry season can be tried in the Sanctuary (Easa and Balakrishnan 1983). Stray dogs have become menace to wildlife, especially around Parambikulam, Thunakadavu and Sungam settlements.

Mathew *et al.* (2002) considered raising of teak plantations after clear-felling extensive areas of natural forests as the major disturbance at Parambikulam. However, being a wildlife sanctuary, these plantations are left without much weeding or extraction of miscellaneous tree species and this has led to the formation of mixed stands over years. In the absence of any further disturbance, the altered forest biota is slowly returning to its normal condition.

KEY CONTRIBUTOR

P. S. Easa

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PEECHI-VAZHANI WILDLIFE SANCTUARY



IBA Site code	: IN-KL-15
State	: Kerala
District	: Thrissur
Coordinates	: 10° 36' 45" N, 76° 24' 25" E
Ownership	: State
Area	: 12,500 ha
Altitude	: 186 – 922 m
Rainfall	: 2,800 mm
Temperature	: 18 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen, Tropical Moist Deciduous, Tropical Semi Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1958

GENERAL DESCRIPTION

The Peechi-Vazhani Wildlife Sanctuary falls in Trichur district in Kerala, the *talukas* being Trichur and Thalappilly. The Sanctuary was formed in 1958 by combining some portions of Peechi, Pattikkad and Machad ranges of Trichur Forest Division. The Sanctuary includes parts of Paravattanimala Reserve, Machadmala Reserve and Bharanipachamala Reserve.

Two dams are present within the Sanctuary with waterspread of 1,295 ha and 184.3 ha, respectively. The terrain is undulating, the altitude varies from 100 to 914 m, with the highest peak Ponnudi. The Sanctuary is contiguous with the Chimmony Wildlife Sanctuary (IBA) on the east and the forests of Palakkad on the north. But, the continuity of the Peechi Forest Range with the Vazhani side has been lost due to the Trichur-Palakkad national highway.

AVIFAUNA

In a survey conducted by the Nature Education Society, Trichur in 1991, 177 species of birds were identified from this IBA. Sri Lanka Frogmouth *Batrachostomus moniliger*, a restricted range species of the Western Ghats Endemic Bird Area (EBA) (Stattersfield *et al.* 1998), was recorded in a reed patch near Palakuzhi (Easa 1991, Nameer 2000). This nocturnal bird is generally found in dense jungle perched on a tree (Ali and Ripley 1987), looking like a piece of dead branch.

Wynaad Laughingthrush *Garrulax delesserti* and Broad-tailed Grass-Warbler *Schoenicola platyura*, both endemic to the Western Ghats are also found here. The Broad-tailed Grass-Warbler is normally sighted above 900 m (Easa 1991). The sighting of this species at Palakuzhi, at less than 100 m, is a record. A nest of the Brown Flycatcher *Muscicapa dauurica* (= *latirostris*) was also recorded near Karadipara (Easa 1991).

Although, not many globally threatened species are found in this site, except for the Broad-tailed Grass-Warbler, seven out of 16 restricted range or endemic species of the Western Ghats EBA are found here. More endemics are likely to occur here as the habitat is quite suitable and moreover, this site adjoins Chimmony where at least two endemics, Grey-headed Bulbul *Pycnonotus priocephalus* and White-bellied Blue Flycatcher *Cyornis pallipes*, are found that are not reported from this site.

The site lies in Biome-10 (Indian Peninsula Tropical Moist Forest), where BirdLife International (undated) has listed 15 species that represent the biome-assemblage. Based on the checklist prepared by the Nature Education Society, seven species of this biome are found here. Probably more will be located once thorough investigation on the bird life is done.

Interestingly, this IBA is an important wintering area for many subtropical and temperate birds of the Himalaya such as Large-crowned Leaf Warbler *Phylloscopus occipitalis*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Blue-headed Rock-thrush *Monticola cinclorhynchus*, Pied Thrush *Zoothera wardii* and Brown-breasted Flycatcher *Muscicapa mutui*. Sixteen species of Biome-11 (Indo-Malayan Tropical Dry Zone) are also found here, but most of them are widespread and common. Many species of this biome have adapted to man-modified habitats, and some have changed their distribution so much that they may not be confined to Biome-11 only (BirdLife International, undated).

Vulnerable

Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
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Endemic Bird Areas 123: Western Ghats

Blue-winged Parakeet	<i>Psittacula columboides</i>
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Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
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Wynaad Laughingthrush	<i>Garrulax delesserti</i>
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Indian Rufous Babbler	<i>Turdoides subrufus</i>
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Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
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Small Sunbird	<i>Nectarinia minima</i>
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White-bellied Treepie	<i>Dendrocitta leucogastra</i>
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Biome-10 Indian Peninsula Tropical Moist Forest

Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
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Malabar Trogon	<i>Harpactes fasciatus</i>
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White-cheeked Barbet	<i>Megalaima viridis</i>
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Crimson-breasted Barbet	<i>Megalaima rubricapilla</i>
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Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
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Black-headed Babbler	<i>Rhopocichla atriceps</i>
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Loten's Sunbird	<i>Nectarinia lotenia</i>
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OTHER KEY FAUNA

Among the primates, Bonnet Macaque *Macaca radiata*, Nilgiri Langur *Trachypithecus johni* and Slender Loris *Loris lydekkerianus* are very often observed in the evergreen, semi-evergreen and moist deciduous areas of the Sanctuary. The Tiger *Panthera tigris*, Leopard *P. pardus* and Jungle Cat *Felis chaus* are among the felines present in the Sanctuary. The Canids are represented by Indian Wild Dog *Cuon alpinus* and Golden Jackal *Canis aureus*. The Bovids present are the Gaur *Bos gaurus* and Nilgiri Tahr *Hemitragus hylocrius*. The Cervids include Chital *Axis axis*, Sambar *Cervus unicolor* and Barking Deer *Muntiacus muntjak*. The Asian Elephant *Elephas maximus* is also found, though not in good numbers. The Giant Squirrel *Ratufa indica* is common in dense canopy forests.

Peechi-Vazhani is important for many endemic reptiles of the Western Ghats. Bhupathy and Choudhary (1995) have recorded the Travancore Tortoise *Indotestudo forstenii*. Thomas and Easa (1997) recorded thirty-one species of reptiles from Peechi area. Of these, the Travancore Tortoise, Gliding Lizard *Draco dussumieri*, Forest Calotes *Calotes rouxi*, *C. elliotti*, Dwarf Gecko *Cnemaspis waynadensis*, and *Ristella beddomii* are endemic to the Western Ghats.

LAND USE

- ☐ Nature conservation and research
- ☐ Forestry

THREATS AND CONSERVATION ISSUES

- ☐ Grazing
- ☐ Firewood collection

About 170 ha land is in possession of tribal and other settlers within the Sanctuary. They cultivate paddy, tapioca, areca-nut, banana, rubber and coconut. They also collect Minor Forest Produce (MFP). Cattle grazing is a major problem. Goats are kept by villagers, which are very destructive to the natural regeneration process. In

the reservoir, fishing occurs regularly. Fire is common during summer, generally lit by villagers to get new growth.

Before the declaration of the Sanctuary, harvesting of timber and bamboo was allowed. These operations have stopped, except for thinning of teak plantations.

Peechi Lake and Vazhani Lake attract lots of tourists, mainly for picnics. They can be regulated and imparted conservation knowledge through interpretation centres and publication of good take-away literature. This IBA is also an excellent area for long-term research on endemic flora and fauna of the Western Ghats.

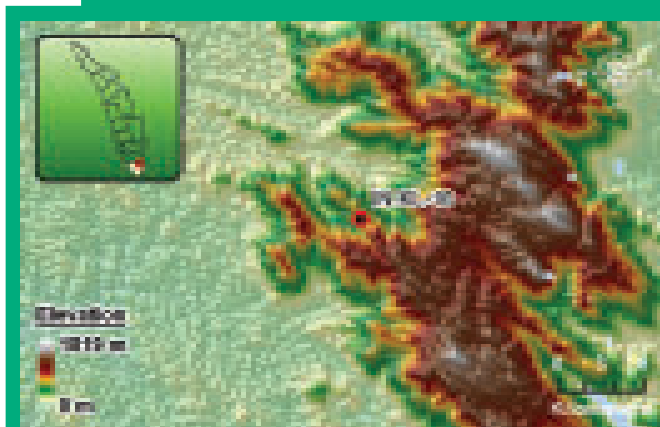
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P. S. Easa and P. O. Nameer.

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PEPPARA WILDLIFE SANCTUARY



IBA Site Code	: IN-KL-16
State	: Kerala
District	: Trivandrum
Coordinates	: 8° 46' 01" N, 77° 08' 53" E
Ownership	: State
Area	: 5,300 ha
Altitude	: 90 - 1,717 m
Rainfall	: 3,200 m
Temperature	: 16 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Dry Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous Forest, Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in December 1983

GENERAL DESCRIPTION

Peppara Wildlife Sanctuary is a part of the Agasthyamalai forests in Thiruvananthapuram district. It is bordered on the northeast by Kalakkad-Mundanthurai Tiger Reserve of Tamil Nadu, on the north by Palode Reserve Forest, south by Neyyar Wildlife Sanctuary (IBA), and to the southwest by Agasthyavanam Biological Park. The topography is rugged, with flat meadows and gentle to steep slopes. The River Karamana, on which a dam has been constructed, resulting in a reservoir of 5.82 sq. km, drains the forest.

The presence of a rock formation called 'Para Appu' is a remarkable feature of these hills. The Sanctuary is well known for its excellent scenic beauty, cool and luxuriant vegetation. It has West Coast Tropical Evergreen and Semi-evergreen, Southern Moist Deciduous, Southern Tropical Hill, and Southern Hilltop Evergreen Forests (Champion and Seth 1968). Reed brakes and *Myristica* swamps are also found. The West Coast Tropical Evergreen Forest is seen in comparatively small portions in Palode area. Trees are as tall as 30 m. The undergrowth is a mixture of canes, palms and ferns. Between 150 to 1,000 m, on the hilly slopes, West Coast Semi-evergreen Forest is seen, with Bamboo *Bambusa arundinacea*. The trees are covered with epiphytes and climbers. About 60% of the Sanctuary is covered with Southern Moist Mixed Deciduous Forest. Southern Hilltop Tropical Evergreen Forest is found above 1,000 m on top of the hills and sholas, exposed to

heavy wind. Such forest can be seen in Manochola, Kovilthery, Athirumala and Chemmuji areas of this IBA.

Peppara is one of the seven Medicinal Plant Conservation Areas in Kerala. "Arogyapacha" (*Trichopus zeylanicus*), a medical herb, is found in this Sanctuary in abundance.

AVIFAUNA

No work on the avifauna has been done in Peppara, except for a short bird watching trip in August 2003 by S. Susanth (*pers. comm.* 2003) during which he listed 40 species. Most of them are common. Malabar Grey Hornbill *Ocyrceros griseus* was the only restricted range species. He also saw Malabar Trogon *Harpactes fasciatus*, which is one of the 15 species of the as biome-restricted assemblage of Indian Peninsula Tropical Moist Forest (BirdLife International, undated).

The globally threatened White-bellied Shortwing *Brachypteryx major* was seen at this site by Robin (2001).

As we do not have sufficient information on the bird life, this site is being considered as Data Deficient.

A dam has been constructed over Karamana River. The forest of this IBA is its catchment.

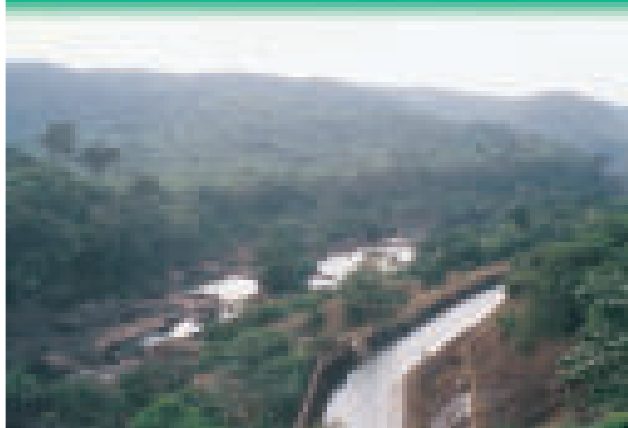


Photo: M. Zafar-ul-Islam

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>

OTHER KEY FAUNA

Peppara has a rich variety of endemic and rare fauna, such as the Lion-tailed macaque *Macaca silenus*, Nilgiri Langur *Trachypithecus johni*, Nilgiri Tahr *Hemitragus hylocrius* and Nilgiri Marten *Martes gwatkinsi* (Christopher and Jayson 1996). The Nilgiri Marten is one of the rarest mustelids in the world. It is found only in the Western Ghats and during the last 100 years there have been only a dozen sightings (Ajith Kumar *pers. comm.* 2001).

Asian Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Cervus unicolor*, Barking deer *Muntiacus muntjak*, Mouse deer *Moschiola meminna*, Sloth bear *Melursus ursinus*, Dhole or Wild

Dog *Cuon alpinus*, and Indian Giant squirrel *Ratufa indica*, are other important terrestrial mammals of Peppara.

LAND USE

- q Agriculture
- q Aquaculture / fisheries
- q Tourism and recreation
- q Nature conservation and research

THREATS AND CONSERVATION ISSUES

- q Grazing
- q Tourism and recreation
- q Collection of Non-Timber Forest Produce

In Peppara, there are 13 settlements of *Kani* tribes, scattered in the buffer zone as well as in the core area (Christopher *et al.* 1994). Their main source of income is agriculture supplemented by gathering of non-timber forest product (NTFP). They are known for their knowledge of traditional medicine and their special expertise in making articles from reeds and rattan. *Kani* were also famous for their adventurous honey collection expeditions on the highly rugged rock cliffs and treetops (Thurston 1909). Christopher and Jayson (1996) record that the open auction twice a week of NTFPs collected by *Kani* tribals from Peppara, greatly benefited them. But now, non-tribals living around the Sanctuary compete heavily with the *Kanis* for the collection of NTFP, especially for reeds and rattan. If the area is managed as a wildlife sanctuary, the tribals could get sustained yields of NTFP, and because of their centralized auction market, they would obtain good remuneration for their products, thus giving them a stake in the protection of this area. There is a great opportunity to integrate the local tribals in the management of the Sanctuary, especially when they have such vast knowledge of the forest.

In order to reduce their dependence on the forest, there is a proposal to relocate them outside the Sanctuary in the failed plantations of the Kerala Forest Development Corporation Ltd. at Chathankodu.

Peppara is easily accessible, only 50 km from Thiruvananthapuram city, and thus, it can become one of the main tourist destinations, but extreme care should be taken to avoid overburdening the ecosystem.

KEY CONTRIBUTOR

E. A. Jayson

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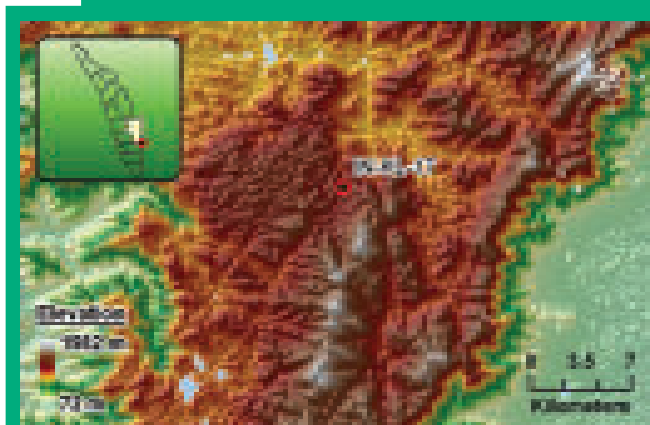
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Logging in many areas of Kerala is to be checked to retain some of the pristine habitats.



Photo: M. Zafer-ul-Islam

PERIYAR WILDLIFE SANCTUARY



IBA Site code	: IN-KL-17
State	: Kerala
District	: Idukki
Coordinates	: 9° 26' 43" N, 77° 14' 52" E
Ownership	: State
Area	: 77,700 ha
Altitude	: 150 – 2,019 m
Rainfall	: 2,500 mm
Temperature	: 10 °C to 31 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen Forest, Reservoir

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Areas 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1950

GENERAL DESCRIPTION

The Periyar Tiger Reserve is one of the most famous Tiger Reserves of India. The Reserve has an area of 77,700 ha, including Periyar Lake, (area 2600 ha). The boundaries are Madurai and Ramanadhapuram districts in the east, Kottayam district in the west and Pathanamthitta district in the south. It was one of the first Project Tiger areas of the country.

This IBA lies among rolling hills and forested valleys that stretch across a section of the Western Ghats. It falls more or less steeply to populated lowlands on all sides, except along the northwest boundary flanking the more cultivated parts of the Cardamom Hills, and in the northeast and southeast corners where narrow corridors link with outlying hill areas, the High Wavy and Panthalam ranges, respectively. The northern and eastern boundary of the Park follows the Kerala/Tamil Nadu border along the crest line for about 90 km.

The lowest elevation is 150 m along the Pambiyar river in the Kerala foothills, but this is not typical as most of the Reserve lie between 750 to 1,500 m. The Periyar lake sprawls through the uneven terrain with many bays, islands and long creeks winding up side valleys. Most of the land was not cleared before being flooded, and the bare, gaunt skeletons of long-dead forest hardwood still litter the water. The maximum depth is 42 m and the shoreline is generally steep.

The vegetation of the Sanctuary is mainly composed of Tropical Evergreen Forest and Semi-evergreen Forest. In the central part of the Sanctuary, Moist Deciduous Forest and grasslands predominate. Reed brakes are primarily located in evergreen and semi-evergreen forests (Chandrasekhran 1973). There is *Eucalyptus* plantation in the buffer zone in the west.

Among the 1,272 plant species that are considered endemic to the southern Western Ghats, 515 species were collected from Periyar (Sasidharan 1998). A new species of orchid, *Habenaria periyarensis* has been described from here. This shows the importance of Periyar Tiger Reserve as a biodiversity hotspot.

AVIFAUNA

This IBA is one of the most visited places in south India. Birdwatchers come to see the Western Ghats endemics and forest birds. Despite the presence of a large artificial lake, aquatic bird

life is rather poor overall, apparently due to the deep waters of the lake. So far, 315 species of birds have been identified (Robertson and Jackson 1992).

Sixteen species of birds are considered as endemic in the Western Ghats. BirdLife International (undated) calls them restricted range species, i.e. they have distributional range less than 50,000 sq. km. According to Stattersfield *et al.* (1998), this area lies in the Western Ghats Endemic Bird Area (EBA). Fourteen out of 16 restricted range species are noted from this site. This is not only because a large number of birdwatchers visit this area but mostly due to the good natural habitat.

BirdLife International (undated) has classified species based on biome assemblages. This site lies in Biome-10 (Indian Peninsula Tropical Moist Forest) where 15 species have been found that represent this biome. Eleven of the 15 Biome-10 species are noted from this site, which is also a sort of record. In very few sites, we were able to record so many species.

Periyar is also an important wintering site for many long distance migrants such as Tickell's Leaf Warbler *Phylloscopus affinis*, Large-billed Leaf Warbler *Phylloscopus magnirostris*, Large-crowned Leaf Warbler *Phylloscopus occipitalis*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Pied Thrush *Zoothera wardii* and others.

Periyar is one of the few sites where the occurrence of the Wood Snipe *Gallinago nemoricola* has been confirmed. In India, the Wood Snipe breeds in the Himalaya and winters in southern India. Its population has drastically declined, apparently due to habitat loss in the breeding areas, and hunting in wintering areas (BirdLife International 2001).

Critically Endangered

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

Vulnerable

Greater Spotted Eagle	<i>Aquila clanga</i>
Wood Snipe	<i>Gallinago nemoricola</i>
Nilgiri Wood-Pigeon	<i>Columba elphinstoni</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>

Near Threatened

Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>

Endemic Bird Area 123: Western Ghats

Nilgiri Wood-Pigeon	<i>Columba elphinstoni</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrocus griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>

Biome-10: Indian Peninsula Tropical Moist Forest

Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Jerdon's Nightjar	<i>Caprimulgus atripennis</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-breasted Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

Periyar is renowned for its herds of wild Asian Elephant *Elephas maximus*, seen on the edge of Periyar Lake. Tiger *Panthera tigris* is also not uncommon. Periyar has perhaps the best representative forests where most of the southern Western Ghats endemic and rare mammal species are found, such as the Lion-tailed Macaque *Macaca silenus*, the Nilgiri Langur *Trachypithecus johni* and the Travancore Flying Squirrel *Petinomys fuscicapillus* (Ramachandran *et al.* 1986). Wild Dogs *Cuon alpinus*, uncommon in other forests, are regularly seen in Periyar, chiefly around the lake where their main prey such as Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna* and Wild Boar *Sus scrofa* concentrate. Indian Giant Squirrel *Ratufa indica* and Gaur *Bos gaurus* are very common in this Sanctuary.

Zacharias *et al.* (1996) noted 35 species of fish, including 13 endemic to the southern Western Ghats. Two new species, namely *Lepidopygopsis typhus* (Schizothoracinae) and *Crossocheilus periyarensis* (Cyprinidae) were recorded from Periyar Lake, while *Echthalakanda (Barbus) ophiocephalus* (Cyprinidae) was rediscovered from Periyar river. This was believed to be extinct.

LAND USE

- ☐ Nature conservation and research
- ☐ Tourism

THREATS AND CONSERVATION ISSUES

- ☐ Grazing
- ☐ Collection of fuel wood and other forest products
- ☐ Tourism and recreation
- ☐ Human habitation

Some temporary human encroachment is found inside the Reserve, but on the whole the forest inside the Reserve is well-protected. However, the Reserve is surrounded by human habitations. Within walking distance of Kumili, the forest is under considerable pressure from wood-cutting, and grass patches are heavily grazed by cattle. Permanent cultivation reaches the edge of the Sanctuary in many areas. On the lower southwestern slopes, there are rubber plantations and tea estates, while a scattering of coffee and spices dominate the higher plateau around Vandiperiyar and Peermade. The steep *ghat* slope below Kumili is clothed in increasingly disturbed deciduous woodland, ending abruptly in the agricultural fields of the Cumbum Valley. Cardamom estates surround the forested boundary to the northeast and east, where the equally steep and much higher flanks support more extensive evergreen and moist deciduous forest, with a narrow strip of reserve forest along the base. There has been some planting of eucalyptus on the grassland and there are some abandoned cardamom clearings.

Elephant poaching is a major menace. There are very few tuskers left, and the remaining ones have to be constantly protected.

KEY CONTRIBUTOR

The IBA team

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RANNI RESERVE FOREST



IBA Site code	: IN-KL-18
State	: Kerala
District	: Kollam
Coordinates	: 9° 18' 30" N, 76° 58' 30" E
Ownership	: State
Area	: 87,738 ha
Altitude	: 46 – 1,920 m
Rainfall	: 2,540 – 4,064 mm
Temperature	: 16 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Moist Deciduous Forest, Tropical Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Grasslands

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats) and A3 (Biome-10: Indian Peninsula Tropical Moist Forest), Data Deficient

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Ranni Reserve Forest covers the whole of Goodrical, Rajampara, Karikulam, Shethakkal, Shethakkal Extension and Valiacavu proposed reserve. The major reserves (namely Konni, Rajampara and Goodrical) lie in a compact block adjacent to each other. The whole area is very rugged. There are two main ridges running north-south and forming the eastern and western boundaries of the Goodrical Reserve.

Ranni Reserve Forest (RF) is mostly covered by Southern Tropical Evergreen, Southern Moist Deciduous and Semi-evergreen forests. Evergreen forest is generally met with along the river banks and streams and in places below 1,000 m. Some evergreen forest is also found above 1,200 m in the mountain folds, especially in Goodrical and in the far eastern portions of Konni Reserve. Tropical Moist Deciduous forest exist in most parts of Konni below 800 m.

Regular annual fires result in the spread of grass in the more open areas. The hilltops are covered with grasslands, especially in Murinjarkaru, Nanattupara and Kattadikunnu areas. Extensive patches of natural grasslands are also found in Goodrical on the southern bank of Pamba river. The Working Plan document (Pillai, undated) mentions 165 species of plants, mainly of commercial importance.

AVIFAUNA

Although, no detailed study on the biodiversity has been done in Ranni RF, it is likely to have many Western Ghats endemics, such as Malabar Grey Hornbill *Ocyrceros griseus*, Nilgiri Wood-Pigeon *Columba elphinstonii*, White-bellied Treepie *Dendrocitta leucogastra* and White-cheeked Barbet *Megalaima viridis*. As information on avifauna is not available, we are considering it as Data Deficient.

It is selected as an IBA because this almost compact block of 87,738 ha has good natural forests and grasslands of the Western Ghats. It could have many threatened, restricted range and biome species.

Ranni RF is a huge area and unexplored for birds where Nilgiri Wood-Pigeon could be seen easily.

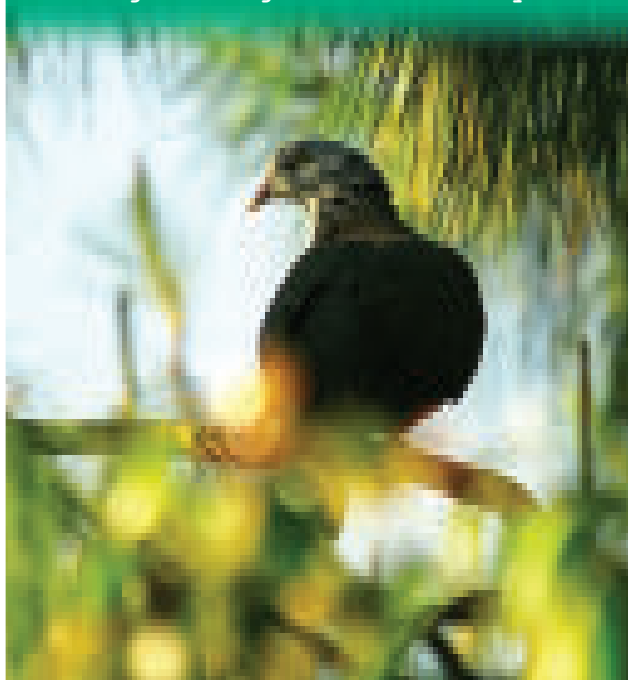


Photo: Clement Francis M.

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>

OTHER KEY FAUNA

Data not available

LAND USE

q Forestry

THREATS AND CONSERVATION ISSUES

Not known

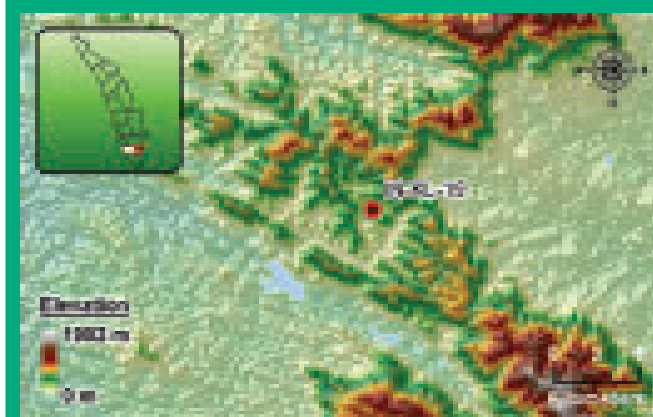
KEY CONTRIBUTORS

State Coordinator and the IBA Team

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SHENDURNEY WILDLIFE SANCTUARY



IBA Site code	: IN-KL-19
State	: Kerala
District	: Kollam
Coordinates	: 08° 59' 18" N, 77° 08' 18" E
Ownership	: State
Area	: 10,032 ha
Altitude	: 200 - 1,500 m
Rainfall	: 3,200 mm
Temperature	: 16 °C to 35 °C
Biogeographic Zone	: Western Ghats
Habitats	: Southern Moist Mixed Deciduous, West Coast Semi-evergreen, Southern Hilltop Tropical Evergreen, West Coast Tropical Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Areas 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1984

GENERAL DESCRIPTION

Shendurney Wildlife Sanctuary, the name is said to have been derived from an endemic plant, *Gluta travancoria*, locally known as Chenkurinji, lies on either side of Shendurney river. It is a valley of green splendour, acclaimed for its biodiversity. Located on the north of Kulathupuzha Valley and separated by the Churuttumala Ridge, it is bounded by the Sahyadri range on the east. Most of the Sanctuary area (about 25 km long and 10 km broad) is hilly and interspersed with ravines. There are quite a few rugged and steep peaks, and the Sanctuary is, therefore, inaccessible in many places.

Before the advent of the British, the entire region was covered with thick evergreen forests of great timber value. White planters, who took possession of large tracts ostensibly for coffee and tea cultivation, ruthlessly destroyed these forests for timber. Most of the areas have since been reclaimed and brought under forest cover. There is no tribal settlement inside the Sanctuary. However, there are three revenue enclosures inside the Sanctuary.

Shendurney encompasses the catchment area of Parapar reservoir (13.72 sq. km), which provides irrigation to Kollam and Pathanamthitta districts. Thick forests, extending to the Tamil Nadu border, assure the perennial flow of water to this reservoir.

The Reservoir of Shendurney WLS provides irrigation to Kollam and Pathanamthitta districts.



Photo: M. Za'far-ul-Islam

Shendurney IBA bears most of the forest types found in the southern part of the Western Ghats. It has West Coast Tropical Evergreen, West Coast Semi-evergreen, Southern Moist Mixed Deciduous and Southern Hilltop Tropical Evergreen forests (Working Plan document). The West Coast Tropical Evergreen forest is mostly found in the southeast of the Sanctuary in Umayar, Dharbhakulam, Pattakulam, Kallar and Rockwood areas. The trees are often 50 m high, and the undergrowth is a mixture of canes, palms and ferns. The West Coast Semi-evergreen vegetation generally adjoins the evergreen belt and grows on the banks of the main rivers and streams. In the Southern Moist Mixed Deciduous, Teak *Tectona grandis* is present occasionally and may be an indicator of secondary succession (Working Plan document). Above 1,000 m, stunted Evergreen forest (sholas), typical of the Western Ghats abound. The height of trees is generally 10-15 m. Common species are *Mesua*, *Hopea*, *Calophyllum*, *Cullenia*, *Syzygium*, *Cinnamomum*, *Calamus* and *Strobilanthus* spp. This type of forest occurs in Pandimotta area and in the eastern frontier ridges.

Shendurney is an important area for the survival of endemic plants of the Western Ghats. In a study by Sasidharan (1997), out of the estimated 1,272 endemic species of the Western Ghats, 460 are threatened under various threat categories. Hundred species that are under threat are found at this site, including 10 that had been considered extinct. Two new species to science, *Polyalthia shendurunii* Bash and Sasi, and *Ardisia stonei* Sasi and Sivar. were described from the Sanctuary.

AVIFAUNA

Ahmed (1996) has observed 84 species, while in bird surveys organized by Warbler and Waders, an NGO, Susanthkumar (1997) reported 204 species. The Kerala Forest Department also organized bird surveys through NGOs and interested people, from 1995 to 2000, involving 36 participants, during which a combined checklist of 245 species was prepared (Anon. 2000). Almost all the Western Ghats endemics were seen in this IBA. The population of the Vulnerable Nilgiri Wood-Pigeon *Columba elphinstonii* appears to be high. Small nesting colonies of River Tern *Sterna aurantia* and Small Indian Pratincole *Glareola lactea* were found. These two species are becoming uncommon, mainly due to disturbance on the breeding grounds.

The site is located in the Western Ghats Endemic Bird Area (EBA) and Biome-10 (Indian Peninsula Tropical Moist Forest). In this EBA, 16 species are listed as endemic or restricted range. Ten species, including two Near Threatened ones, have been found till now. Nine out of 15 species listed in Biome-10 are found here.

This site also serves as an important wintering area for migrants from the Himalayas and further north. Tickell’s Leaf Warbler *Phylloscopus affinis*, Western Crowned Warbler *P. occipitalis*, Large-billed Leaf Warbler *Phylloscopus magnirostris*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Brown-breasted Flycatcher *M. muttui* and Blue-headed Rock-thrush *Monticola cinclorhynchus* are some of the migrants of temperate and subtropical Himalayas commonly seen here. Till now, sixteen species of Biome-11 (Indo-Malayan Tropical Dry Zone) have been seen at this site. Most of them are quite common and widespread, so they fall in Least Concern category of BirdLife International (2001).

Vulnerable	
Lesser Kestrel	<i>Falco naumanni</i>
Wood Snipe	<i>Gallinago nemoricola</i>
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied TreePie	<i>Dendrocitta leucogastra</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten’s Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

Shendurney IBA has almost all the larger mammalian fauna of the southern Western Ghats, such as the Asian Elephant *Elephas maximus*, Gaur *Bos gaurus*, Barking Deer *Muntiacus muntjak*, Tiger *Panthera tigris*, Indian Giant Squirrel *Ratufa indica*, Lion-tailed Macaque *Macaca silenus* and Slender Loris *Loris lydekkerianus*. It is also known for its endemic butterflies such as the Southern Birdwing *Troides minos*, Malabar Rose *Pachliopta*

pandiyana, Malabar Tree Nymph *Idea malabarica*, Red Helen *Papilio helenus*, Southern Duffer *Discophora lepida*, Blue Pansy *Junonia orithya* and Malabar Raven *Papilio dravidarum*.

LAND USE

- ☐ Forestry
- ☐ Conservation

THREATS AND CONSERVATION ISSUES

- ☐ Collection of fuel wood and other forest produce
- ☐ Livestock grazing
- ☐ Crop cultivation

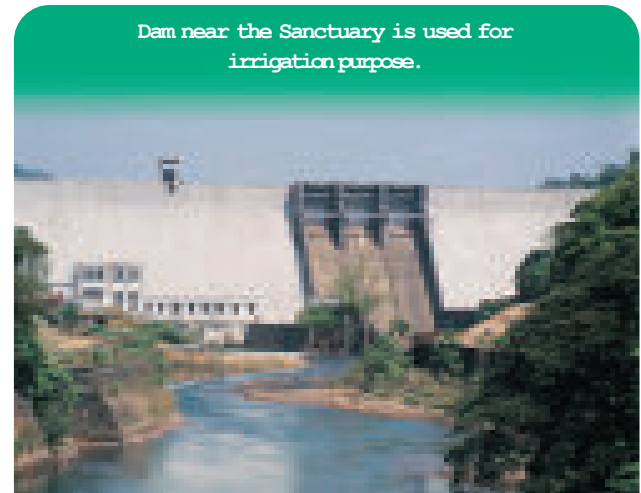


Photo: M. Zafar-Ul-Islam

Though there are no tribal settlements inside the Sanctuary, the right to collection of Minor Forest Produce through Girijan Co-operative Societies is given to nearby tribes. People residing in and around the Sanctuary have reported instances of damage to agricultural crops by wild animals. Wild animals have also caused physical injuries and even death. It is only natural justice that the victims be appropriately compensated. Kerala Government regularly sanctions such payments

KEY CONTRIBUTOR

The IBA Team

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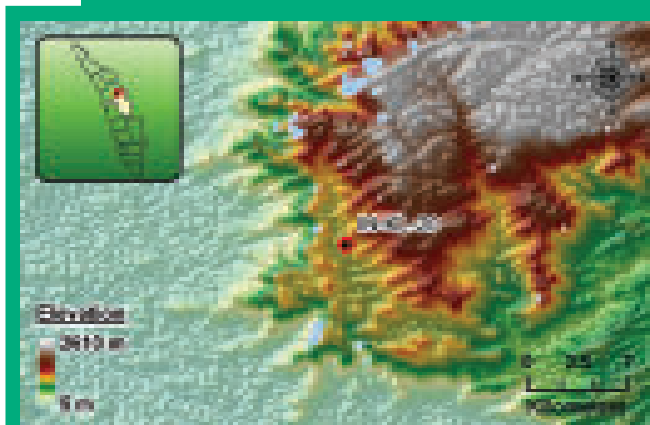
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SILENT VALLEY NATIONAL PARK



IBA Code	: IN-KL-20
State	: Kerala
District	: Palakkad
Coordinates	: 11° 07' 54" N, 76° 25' 47" E
Ownership	: State
Area	: 8,952 ha
Altitude	: 658 - 2,383 m
Rainfall	: 3,500 mm
Temperature	: 8 °C to 40 °C
Biogeographic Zone	: Western Ghats
Habitats	: Southern Tropical Evergreen Forest, Subtropical Hill Forest, Grassland

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established in November 1984

GENERAL DESCRIPTION

Silent Valley is a rectangular tableland enclosed by a high contiguous ridge along its northern and eastern borders, and by a lower, irregular ridge along its western and southern borders. It is flanked by steep escarpments to the south and west, which descend some 1,000 m to the plains of Kerala, and by sheer cliffs to the north and east which rise a further 1,000 m to the Upper Nilgiri Plateau. Kunthipuzha river flows southwards through the entire 15 km length of the Park, dividing it into a narrow western sector of less than 2 km and a wider eastern sector of 5 km. The valley is drained by five main tributaries of the Kunthipuzha, which originate near the eastern border and flow westwards. Only a few minor streams drain into the Kunthipuzha from the western sector. The river is uniformly shallow, with no floodplains. Its bed falls from 1,861 m to 900 m over a distance of 12 km, the last 8 km being particularly level, with a fall of only 60 m. Kunthipuzha is one of the less torrential rivers of the Western Ghats, with a pesticide-free catchment area. The soil is blackish and slightly acidic in the evergreen forests, where there is good accumulation of organic matter. The underlying rock in the area is granite with schists and gneiss, which give rise to the loamy laterite soils on slopes (Anon., undated, 1981, 1982; Unnikrishnan, 1989).

The total area is 8,951.65 ha. The Park is contiguous to the proposed Karimpuzha National Park (22,500 ha) in the north and to Mukurthi National Park (7,846 ha), Tamil Nadu, in the northeast.

The altitude ranges from 658 m to 2,383 m (Balakrishnan 1984). Most of the Park lies between 880 m and 1,200 m (Anon. undated). High peaks such as Anginda (2,383 m), Sispara (2,206 m) and Kozhipara (1,904 m) occur in the northern part of the Park.

Four main types of vegetation can be recognized: Tropical Evergreen Forest, Subtropical Hill Forest, Shola forest and grasslands which are restricted to the narrow sector west of the Kunthipuzha and to the higher slopes and hill tops in the eastern sector. Seven new plant species have been recorded from the Silent Valley (Manilal 1988), as well as many rare, endemic and economically valuable species, such as Cardamom *Elettaria cardamomum*, Pepper *Piper nigrum*, Yam *Dioscorea* spp., various beans *Phaseolus* spp., a pest-resistant strain of Rice (species unknown), and 110 plant species of importance in Ayurvedic medicine (Nair *et al.* 1980).

AVIFAUNA

Kerala's avifauna is well represented within the Park. Two hundred species of birds have been recorded (Jayson 1990, Basheer and Nameer 1990). Four globally threatened species are found here. The Nilgiri Wood-Pigeon *Columba elphinstonii* is an uncommon bird (Zacharias and Gaston 1999, BirdLife International 2001), even in this well protected forest. The Broad-tailed Grassbird *Schoenicola platyura* has a wide range in the Western Ghats but is uncommon everywhere. Santharam (1996) found it in the Poochipara area in December 1990.

The site lies in the Western Ghats Endemic Bird Area (EBA) (Stattersfield *et al.* 1998). In this IBA, all the 16 endemic or restricted range species have been recorded.

Flocks of Wynaad Laughingthrush *Garrulax delesserti* are sighted up to an elevation of 1,700 m. Above that, it seems to be the range of the Nilgiri Laughingthrush *Garrulax cachinnans*. Vijayan *et al.* (1999) also found this species in the upper reaches. Both the species confine themselves strictly to their respective altitudinal ranges. Nilgiri Flycatcher *Eumyias albicaudata*, a Near Threatened species, is common in the foothills of the National Park.

Silent Valley is not only a paradise for local species, but it also host a large number of forest migrants in winter, from the Himalaya and beyond. Some of the forest birds noted are Tickell's Leaf Warbler *Phylloscopus affinis*, Large-billed Leaf Warbler *Phylloscopus magnirostris*, Western Crowned Warbler *Phylloscopus occipitalis*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Brown-breasted Flycatcher *Muscicapa muttui* and Blue-headed Rock-thrush *Monticola cinclorhynchus*.

This site lies in Biome-10 (Indian Peninsula Tropical Moist Forest) where 15 species are considered as representative of this biome's assemblage. Nine of these species have been recorded from Silent Valley NP. Only those species which live in comparatively drier habitats are not found here, for example, the Small Greenbilled Malkoha or Blue-faced Malkoha *Phaenicophaeus viridirostris*, a bird of scrub and secondary jungle, and the Jerdon's Nightjar *Caprimulgus atripennis*, a bird found in scrub forests, edges of moist forests and secondary growth.

Silent Valley NP has been selected as an IBA as it qualifies three criteria (A1, A2, and A3) and more importantly, it has one of the

finest undisturbed forests left in the Western Ghats. This famous forest has significant populations of many threatened and endemic birds. It also adjoins another IBA, Mukurthy NP in Tamil Nadu.

Endangered	
Nilgiri Laughingthrush	<i>Garrulax cachinnans</i>
Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Near Threatened	
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyroceros griseus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Nilgiri Laughingthrush	<i>Garrulax cachinnans</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10 Indian Peninsula Tropical Moist Forest	
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthraceroceros coronatus</i>
Crimson-breasted Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

The faunal diversity is very high and includes a number of endemic and threatened species. Some 26 species of mammals, excluding bats, rodents and insectivores, have been recorded (Balakrishnan 1984). Notable species include Nilgiri Langur *Trachypithecus johni*, Lion-tailed Macaque *Macaca silenus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Jerdon's Palm Civet *Paradoxurus jerdoni*, Wild Dog *Cuon alpinus*, Nilgiri Marten *Martes gwatkinsi*, Asian Elephant *Elephas maximus*, Gaur *Bos gaurus* and Nilgiri Tahr *Hemitragus hylocrius*, some of which are endemic to the Western Ghats. Estimates of large mammal populations are provided by Balakrishnan (1984). Six species of bats have been recorded, of which Peshwa's bat *Myotis peshwa* and Hairy-winged bat *Harpiocephalus harpia* are considered rare. Amphibians total 19 species, lizards 9 species and snakes 11 species (Kerala Forest Department 1990). Notable records are two fishes (*Holaloptera pillae* and *Garra menimi*) and two amphibians (the primitive caecilian *Ichthyophis longicephalus* and Malabar tree toad *Nectophryne tuberculosa*).

Kerala's avifauna is well represented within the Silent Valley National Park.

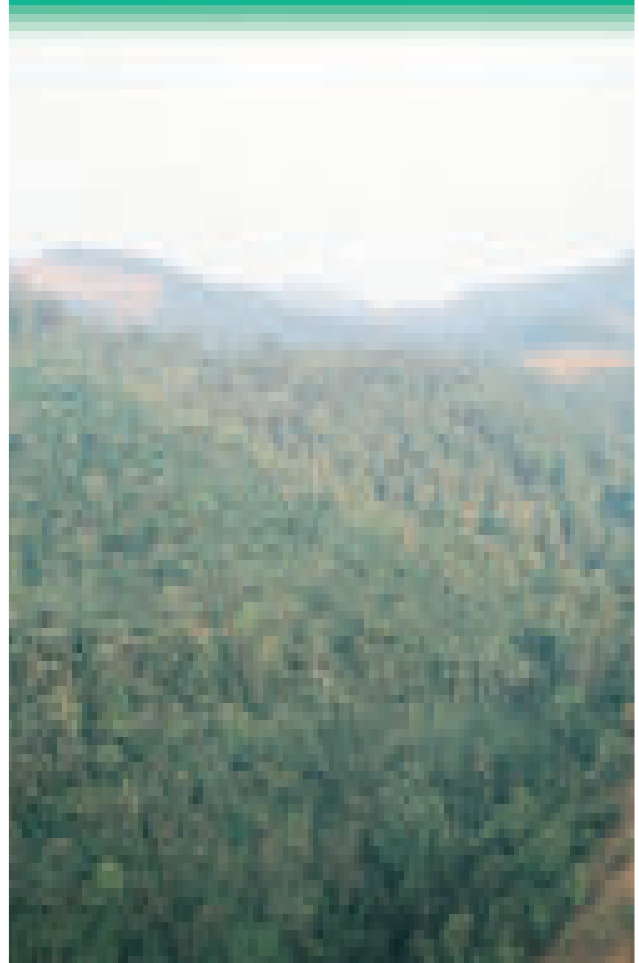


Photo: M. Zafar-ul-Islam

Lepidoptera comprise about 100 species of butterflies and about 400 of moths, of which 13 are endemic to South India, and now have very restricted distributions, mostly within the Western Ghats (Mathew 1990).

LAND USE

- ☐ Nature conservation and research
- ☐ Forestry

THREATS AND CONSERVATION ISSUES

- ☐ Grazing
- ☐ Firewood collection

A large number of people in the Mannarghat plains depend directly on the perennial flow of water in Kunthipuzha. The whole cultural fabric of these people is woven around the fact that this river retains its flow even in the harshest of summer. Bharathapuzha, which receives the water from Kunthipuzha is dry, except for this lean flow through the summer heat.

The greatest threat to the forest of Silent Valley has been warded off with the abandonment of the hydroelectric power project and dam and the consequent declaration of the National Park. At present, forest fires have assumed a major role as the destroyer of prime forest. Uncontrolled tourism activities can equally well destroy the forest environment. A constant check on all these major factors is essential to the well being of the National Park.

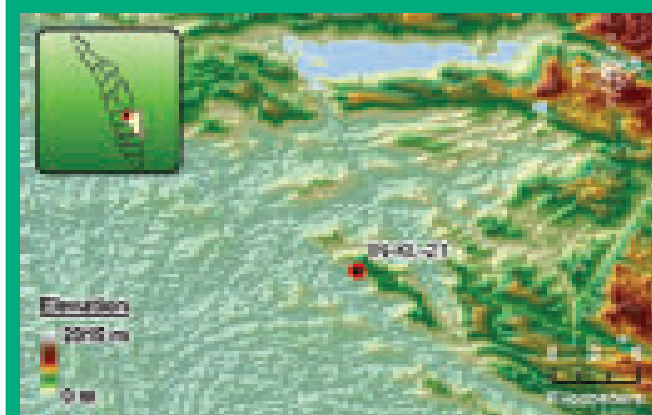
KEY CONTRIBUTOR

The IBA Team

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THATTEKAD WILDLIFE SANCTUARY



IBA Site Code	: IN-KL-21
State	: Kerala
District	: Idukki
Coordinates	: 10° 06' 38" N, 76° 43' 45" E
Ownership	: State
Area	: 2,516 ha
Altitude	: 35–523 m
Rainfall	: 2,500 mm
Temperature	: 20 °C to 36 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Wet Evergreen, Tropical Semi evergreen, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1983

GENERAL DESCRIPTION

The Thattekad or Sâlim Ali Bird Sanctuary is situated in Devicolam taluka of Idukki district, on the northern bank of River Periyar. The Rivers Periyar and Edamalayar meet at Koottickel in the southwest before reaching Bhoothathankettu Dam. The southeast boundary is the reserve boundary of Neriya Mangalam Range over a distance of 5 km. Kuttampuzha village is located on the eastern and northeastern sides. Most parts of the Sanctuary area are hilly and fully covered by forest.

The Periyar and Kuttampuzha rivers on two sides and Kolombathodu and Orulamthanni on the other two sides border the Sanctuary. Thattekad lies at the base of the western slopes of the Western Ghats. The highest point in the Western Ghats, the Anaimudi Peak (2,695 m), is directly uphill of Thattekad. The terrain is undulating and includes two high peaks called Thoppimudi and Njayapillimudi. Bhoothathankettu Barrage has created a large and deep water body, 6 to 10 m deep. This has destroyed almost all the luxuriant riverain forest, which existed along the banks. About one-third of the total Sanctuary area is under monoculture, mainly of Teak *Tectona grandis* and *Dipterocarpus*. The remaining forest consists of somewhat disturbed Evergreen, Semi-evergreen and Moist Deciduous forests and grassland with rocky outcrops. There are some private holdings, ranging from 0.02 ha to 6.07 ha or more along the fringes of the Sanctuary. However, there are no settlements inside the Sanctuary. Since its declaration as a Sanctuary in 1983, there have been no regular forestry extraction and plantation activities inside the Sanctuary area. As a result, there is a fairly thick undergrowth everywhere, including in the plantation.

AVIFAUNA

Thattekad is a bird watcher's paradise and its importance has been appreciated by the internationally known ornithologist Dr. Sâlim Ali, who recorded 167 bird species here (Ali 1964). Later, Sugathan and Verghese (1996) have recorded 269 species from this IBA.

During his visit to Thattekad in the 1930s, Sâlim Ali described it as the richest bird habitat in peninsular India, comparable only with the Eastern Himalayas. In 1983, the Government of Kerala declared it as a Bird Sanctuary on his recommendation. It is now very popular with birdwatchers and new species are being added constantly to the bird checklist of Thattekad. To date, 271 bird

species have been reported from the Sanctuary, including some globally threatened and restricted range species.

Sugathan and Verghese (1996) have reviewed the birds found in Thattekad (but see comments by Santharam 2000). They found that globally threatened Nilgiri Wood Pigeon *Columba elphinstonii* is "not uncommon" and moves between the moist evergreen forests and plantations with secondary forest. But, Simpson (2000) saw only a single bird in December 1999. He was also told that it is common in the Sanctuary.

Thattekad has three globally threatened species and eleven restricted range species. The site lies in the Western Ghats Endemic Bird Area (EBA). Sixteen species have been identified in this EBA. All those restricted range species which are likely to occur here are found, which proves that the habitat is suitable. However, species composition and density have changed. For example, Ali and Whistler (1936) and Ali (1964) found Wynaad Laughingthrush *Garrulax delesserti* as one of the commonest birds in Thattekad in the humid rainforest and dense undergrowth, while Sugathan and Verghese (1996) say that it is a rare resident, and very rarely seen nowadays. This is despite the fact that the latter have done extensive mist-netting in this site which would have brought out this skulking bird, while Ali had no such facility.

Thattekad lies in Biome-10 (Indian Peninsula Tropical Moist Forest) of the BirdLife International (undated) classification. Fifteen species are listed in this Biome of which nine have been identified from Thattekad till now.

One of the interesting species is the Ceylon Frogmouth *Batrachostomus moniliger*, a bird of undisturbed rainforest. While Sugathan and Verghese (1996) say it is rare, Simpson (2000) who did two nights birdwatching at this site, found it "very common, both inside and outside the sanctuary; 10+ heard in three hours one evening".

According to Sugathan and Verghese (1996), Broad-tailed Grassbird (Grass Warbler) *Schoenicola platyura* is resident but not common. It affects grass and scrub covered hillsides.

Thattekad is also a wintering site for many uncommon migrants, such as Rufous-tailed (Rusty-tailed) Flycatcher *Muscicapa ruficauda*. According to Sugathan and Verghese (1996) it is a rare winter visitor. Simpson (2000) also saw it only in Thattekad in south India. It has wide distribution in Asia but in India, it is a bird

of temperate forest of the Himalayas between 1,800 m to 3,500 m. Another interesting species is Tytler’s Leaf Warbler *Phylloscopus affinis*, a rare winter visitor to Thattakad, with two records (Sugathan and Verghese 1996). It mainly winters in the northern parts of the Western Ghats, especially around Mahabaleshwar in Maharashtra.

One of the most interesting records is of Green Munia *Amandava formosa*, a globally threatened species (BirdLife International, 2001). It is a bird of scrub forest and open jungles of central and northwest India. Sugathan (see Santharam 2000 and editor’s note) saw around seven birds for two consecutive years. Two birds were even mist-netted for identity confirmation. It is possible that they were escapees, as Green Munia is a popular cage bird (R. Bhargava, pers. comm. 2001).

Vulnerable	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Pallid Harrier	<i>Circus macrourus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten’s Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

Despite its small size, Thattakad is home to most of the large mammals found in this area, such as the Asian Elephant *Elephas maximus*, Tiger *Panthera tigris*, Leopard *Panthera pardus*, Leopard Cat *Felis bengalensis*, and Sloth Bear *Melursus ursinus*. The Small Travancore Flying Squirrel *Petinomys fuscocapillus fuscocapillus*, an endemic to the southern Western Ghats, is also found in Thattakad. Draco or Gliding Lizard *Draco dussumieri* is common in evergreen and semi-evergreen forests.

LAND USE

- ☐ Nature conservation and research
- ☐ Forestry
- ☐ Tourism

THREATS AND CONSERVATION ISSUES

- ☐ Grazing
- ☐ Firewood collection

A small township has developed at Kuttampuzha, adjacent to the Sanctuary. Part of Kuttampuzha village lies within the territorial area of Thattakkad Sanctuary. The land assigned on either side of Thattakkad-Pooyamkutty road for food production had expanded into the forestland subsequently. Consolidating the boundary by building permanent cairns has arrested degradation. The adjoining areas are educationally and industrially backward. The main occupation of the villagers is agriculture. For meeting their various needs, they enter the forest illegally. Even though the majority is economically sound, many of them, including the unemployed, go into the forest for illicit felling of trees. The people residing in the adjoining lands (*patta* land) and occupied land pose a real threat to the Sanctuary. There is a need for a strong environment education movement involving local people to show them the importance of this IBA. As this IBA is popular among tourists, tourism based industries could be developed to benefit local people.

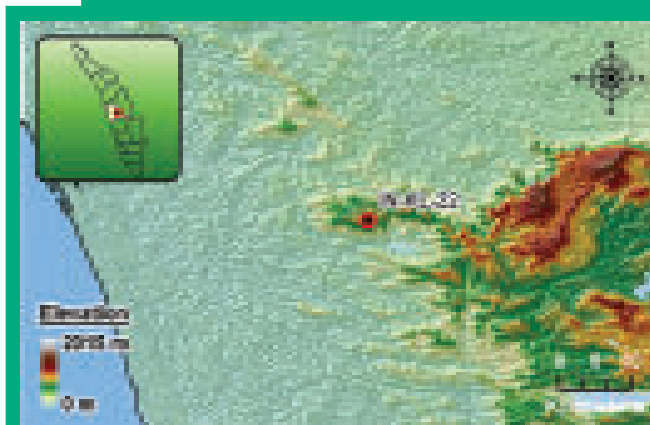
KEY CONTRIBUTOR

The IBA Team

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VAZHACHAL FOREST DIVISION



IBA Site Code	: IN-KL-22
State	: Kerala
District	: Thrissur and Ernakulam
Coordinates	: 10° 28' 09" N, 76° 25' 51" E
Ownership	: State
Area	: 41,300 ha
Altitude	: 200 – 1,300 m
Rainfall	: 3,000 mm
Temperature	: 14 °C to 36 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Dry Evergreen, Tropical Wet Evergreen, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Vazhachal Forest Division falls in Mukundapuram taluka of Trichur district and Aluva taluka of Ernakulam district. The division started functioning from April 26, 1985. It is a long and narrow tract of about 413 sq. km (Karim 1990). The Division comprises of five forest ranges, namely Athirappalli, Charpa, Vazhachal, Kollathirumedu and Sholayar.

The highly undulating terrain varies from 200 m to a maximum height of 1,300 m (Karimala Komban in Sholayar Range). These forests are situated on the western slope of the Western Ghats and therefore receive copious amount of rainfall. The eastern side of the division is more rugged than the west.

Most parts of Vazhachal Reserve Forest (RF) consist of West Coast Tropical Wet Evergreen, West Coast Tropical Semi-evergreen and Southern Tropical Moist Mixed Deciduous forests. The rest of the area is under various plantations. In the Tropical Evergreen Forests we find *Dipterocarpus*, *Vateria*, *Palaquium*, and *Machilus* spp. Semi-evergreen forests consist of *Artocarpus*, *Hopea* and *Tetramelus* as dominant. In the areas with Moist Deciduous vegetation, we generally find *Tectona grandis*, *Dalbergia*, *Lagerstroemia*, *Pterocarpus*, *Terminalia*, *Grewia*, *Bombax* and *Emblca* spp.

AVIFAUNA

In a five-day survey in April 1996, 139 species of birds were recorded by Nameer and Cheeran (1996), of which 24 were migrants. Susanth Kumar (1996) has recorded 120 species from Vazhachal-Sholayar. Detailed study in different months would reveal more species, as many forest birds could not be seen or identified (especially warblers).

The sighting of Malabar Pied Hornbill *Anthracoceros coronatus* was noteworthy. This is one of the uncommon hornbills of the Western Ghats with patchy distribution (Nameer and Cheeran 1996). Other uncommon birds seen were Great Pied Hornbill *Buceros bicornis*, Great-eared Nightjar *Eurostopus macrotis*, Rufous-bellied Hawk Eagle *Hieraetus kienerii*, Darter *Anhinga melanogaster*, and Broad-billed Roller *Eurystomus orientalis*.

Although no globally threatened species was sighted in this IBA, there are chances of occurrence of Nilgiri Wood Pigeon *Columba elephinstonii*, as this bird moves around in search of fruiting trees. Suitable habitat for this species (wet evergreen and semi-

evergreen forest) is present in this site.

Vazhachal RF lies in Western Ghats Endemic Bird Area (EBA). Sixteen species have been identified in this EBA (Stattersfield *et al.* 1998). Six have been listed by Nameer and Cheeran (1996).

The site lies in Biome-10 (Indian Peninsula Tropical Moist Forest) where nine out of 15 biome-restricted species have been seen till now, but more are likely to occur as the habitat is still intact.

This site fits two IBA criteria: A2 (Restricted Range species: EBA), and A3 (Biome-restricted assemblages). It is also included in the IBA list as the site has good representative of Tropical Secondary Evergreen, Tropical Wet Evergreen and Tropical Moist Deciduous Forest of the Western Ghats Endemic Bird Area.

Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Endemic Bird Area 123: Western Ghats	
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10 Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridi</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Yellow-browed Bulbul	<i>Iole indica</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten's Sunbird	<i>Nectarinia lotenia</i>

Great Pied Hornbill *Buceros bicornis* is one of the Near Threatened bird found in this IBA.

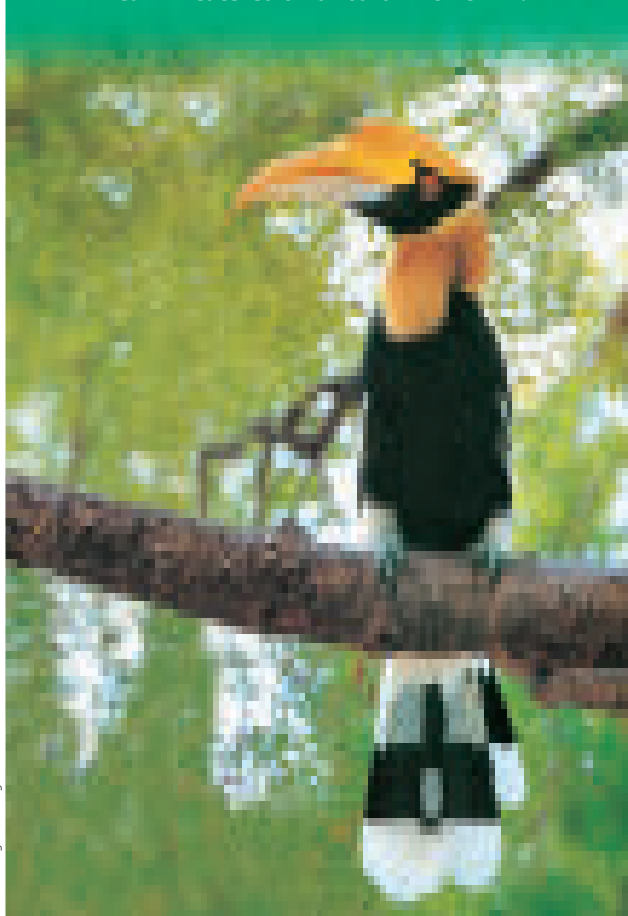


Photo: Rajat Bhargava

OTHER KEY FAUNA

Checklist of mammals and other taxa is not available with us but looking at the extent of natural forests, the following widespread species are likely to be present: Leopard *Panthera pardus*, Barking Deer *Muntiacus muntjak*, Sambar *Cervus unicolor*, Spotted Deer *Axis axis*, Mouse Deer *Moschiola meminna*, Sloth Bear *Melursus ursinus*, Nilgiri Langur *Trachypithecus johni*, Common Langur *Semnopithecus entellus* and Indian Giant Squirrel *Ratufa indica*.

LAND USE

- ☐ Forestry
- ☐ Nature conservation and research

THREATS AND CONSERVATION ISSUES

Not Known

KEY CONTRIBUTORS

P. O. Nameer and Jacob V. Cheeran

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VEMBANAD LAKE



IBA CRITERIA: A4i (≥1% biogeographic population), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Vembanad, one of the declared Ramsar site, is a coastal lagoon (Nameer 1993). It has a single, relatively narrow opening to the sea and must have been formed by the detritus dumped by six perennial rivers forming a narrow sand bar in the sea further west of the seashore. These six rivers (Achankoil, Pamba, Manimala, Meenachil, Moovatupuzha and part of Periyar) originating in the Western Ghats, with an annual rainfall of 4,000 to 5,000 mm and with extremely steep gradients in the channel, bring down considerable quantum of detritus. So over a period of time the sand bar in the coastal sea consolidated and stretched from near Kayamkulam in the south to Kochi in the north. The only mouth of the enclosed shallow water body is at Kochi. The lagoon thus formed is called the Vembanad backwater. In addition, during the rainy season, from July to October, the surplus discharge extends the waterbody by an additional 100-150 sq. km.

Vembanad extends north-south, parallel to the shoreline, and is widest at its southern extremity, forming a bowl located about 3 m below msl. During summer, when the freshwater discharge in the rivers is reduced, water in the 100-150 sq. km flooded area recedes. Seawater flows inland through the Kochi mouth and gradually moves inland. By February-March, salinity reaches all parts of Vembanad. However, the salinity has a gradient with the highest levels near the northern sea mouth, gradually reducing southwards.

All the six rivers emptying into the backwaters form braided channels, which fuse and split repeatedly, forming a delta-like configuration, which gets flooded during the rains.

As Vembanad has been under human occupation for a long time, the natural vegetation has all but disappeared, except in the sacred groves of temples. A tiny portion of the once extensive Lowland Wet Evergreen Forest survives in a few sacred groves.

Detailed literature on the vegetation of Vembanad Lake is not available to us. Sreekumar (2002) lists six species of mangrove (*Avicennia officinalis*, *Bruguiera gymnorrhiza*, *Rhizophora apiculata*, *R. mucronata*, *Sonneratia cascolaris* and *Kandelia candel*), 17 species of marshy and mangrove associates, eight non-mangroves, 15 hydrophytes, 18 weeds and garden escapes, and 12 species of plants under cultivation. In Pathirammal area of the lake, the endangered and endemic plant *Aponogeton appendiculatus* is seen (Red Data Book of Indian Plants, Botanical Survey of India, p. 31).

AVIFAUNA

The Nature Education Society, Trichur (NEST) was perhaps the first to bring out a comprehensive checklist of birds of Vembanad Lake (Nameer 1993). During their surveys coordinated along with the Asian Waterfowl Census (AWC), NEST identified 149 species of birds in January 1993. The total number of birds seen was 36,500 of 32 waterbirds and three raptors. About 57% of the species seen belonged to Anatidae, followed by Phalacrocoracidae (19%) and Ardeidae (17%). Many species of birds were much above their 1% biogeographic population threshold (see Wetlands International, 2002 for latest population thresholds). For example, 4,562 Little Cormorants *Phalacrocorax niger* were counted in 1993, while their 1% threshold is only 1,500 (Wetlands International 2002). Garganey *Anas querquedula* concentrates at Vembanad in large numbers. More than 8,000 were counted while the 1% population threshold is only 2,500. The Indian Whiskered Tern *Chlidonias hybridus* also concentrates here in large numbers, sometimes up to 1,700 individuals are seen (Nameer 1993).

The Department of Forests and Wildlife, Government of Kerala with the help of Kottayam Nature Society conducted a survey after a period of eight years in 2001. This survey recorded 15 species not seen earlier in 1993. Although the number of bird species increased to 171, there was 45% decline in the bird population (Sreekumar 2001). But more alarming than the fall in the total number, was certain changes in the species composition in some important habitats. For instance, the un-reclaimed portion of Vembanad Kayal between Pathiramanal and Kumarakom had been the most important roosting site for migrant ducks and teals. Flocks totalling 25,000 were observed earlier. During 2001, only hundred odd ducks were seen here. The greatest loss in the recent past has been of the Northern Pintail *Anas acuta* (2,000 in 1993, but only 39 in 2001), Garganey (8,000 in 1993, none in 2001), and Common Teal *Anas crecca* (1,000 in 1993, none in 2001). However, at the same time, some species showed an increase. For example, the Lesser Whistling Duck *Dendrocygna javanica* increased from 5,000 in 1993, to 10,464 in 2001 and the Little Cormorant increased from 4,562 in 1993, to 6,058 in 2001 (Sreekumar 2001). The population of the Indian Whiskered Tern remained almost same – 1,779 in 1993 and 1,888 in 2001.

In 2002, Kottayam Nature Society conducted the AWC again with the help of the Department of Forests and Wildlife (Sreekumar

2002). The figures were alarming. A total of 13,276 birds were counted, almost half of the 2001 figures. This included land birds such as the Greater Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, Black Kite *Milvus migrans* and Black-winged Kite *Elanus caeruleus*. A general decrease in the number of almost every species was seen, except for few such as the Black-headed or White Ibis *Threskiornis melanocephalus* (Near Threatened) which increased from 1 in 2001 to 20 in 2002, Cotton Teal or Pygmy Goose *Nettapus coromandelicus* from 156 in 2001 to 631 in 2002. Northern Pintail showed some increase from 39 in 2001 to 1,700 in 2002. The Whiskered Tern also increased from 1,888 in 2001 to 3,483 in 2002. The greatest fall was seen in the number of Lesser Whistling Duck: only 962 were counted in 2002. Some species were not seen at all in 2002. While the Pheasant-tailed Jacana *Hydrophasianus chirurgus* disappeared in 2002, the Bronze-winged Jacana *Metopidius indicus* was seen for the first time. However, the overall trend was not good. The decline was mainly due to decrease in the number of ducks. The so-called Bird Sanctuary of the Kerala Tourism Development Corporation showed a decline in the number of birds. This is extremely significant as this is the only breeding area of waterbirds in this region (Sreekumar 2002).

Despite the decrease in duck numbers due to increased disturbance by motorboats, Vembanad Lake still has great potential to bring them back to their former numbers, once motorboat movement is controlled. We have included this lake in the IBA list as it still has great potential to attract large numbers of waterbirds, once corrective measures are undertaken.

OTHER KEY FAUNA

Vembanad Lake is famous for its fisheries. A list prepared by Dr. K. G. Padmakumar (Sreekumar 2002), enumerates 58 species of fish, including many commercial fish such as *Catla catla*, *Labeo rohita*, *Ctenopharyngodon idella*, *Wallago attu*, and *Channa punctatus*. Shellfish *Macrobrychium rosenbergii*, *M. idella* and *Metapenaeus dobsoni*, and *Lamellidens* sp. *Villorita cyprinoides*, *Meretrix meretrix* and *M. casta* are the molluscs reported from this lake.

LAND USE

- q Agriculture
- q Ecotourism and recreation

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Tourism
- q Unregulated development

Over the last few centuries, reclamation for agriculture has been going on. The shallow margins, with minimum flood impact and better soil suitable for agriculture (approximately 302 sq. km) have been reclaimed by erecting bunds which are then stabilized with coconut cultivation (Nameer 1993). Since early 1950s, efforts have been going on to erect a barrier across the Vembanad at a narrow

point at Thanneermukkom. This barrier has shutters, which can be closed in summer to prevent the seawater from moving in, or raised to permit the floodwaters to drain out. In addition, a cut has been made in the sand bar separating Vembanad from the sea at a place known as Thottappally, southwest of the barrier, to let the excess water behind the shutters to empty into the sea during floods (Nameer 1993). In short, every attempt is being made to reclaim more and more land for cultivation.

The lime shell deposit on the floor of the lake is being dredged for the last 40 years, and is the main raw material for two factories in the district (Sreekumar 2001). Dredging has disturbed about 75% of the lake floor.

Vembanad Lake is only one of the tourist attractions in Kerala facing increasing threats of excessive tourism. Speedboats and houseboats have increased – hundreds of thousands of migrant ducks that used to congregate here have disappeared due to disturbance. The natural contours of the lake have given way to granite walls, further reducing the natural habitat for birds (Sreekumar 2001).

Exotic weeds such as *Eichornia* and *Salvinia* have played havoc in Vembanad, especially in the shallow areas (Nameer 1993).

Till 1990, the Kerala Tourism Development Complex of (KTDC), previously known as Baker Estate, had the long stretch of mangrove. Between 1990 and 1996, 75% of the mangroves were cleared. In the past, the Baker family protected the mangroves, and till the 1980s, between 3,000 to 4,000 Black-crowned Night Herons *Nycticorax nycticorax* used to breed here, along with Darter, Little Cormorant, Median Cormorant, Purple Heron, Large Egret and Pond Heron. The KTDC wanted to clear the mangrove and build 'honeymoon' cottages, but due to a public outcry, the plan was shelved. The Government of Kerala wants to develop a bird sanctuary, but the KTDC wanted land inside protected areas such as Periyar, Neyyar, Vazhachal and Parambikulam (all IBAs) as compensation. The proposal of a bird sanctuary was shelved (Sreekumar 2002).

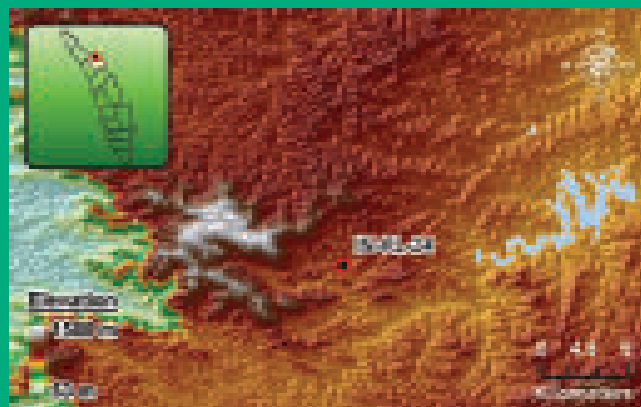
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P. O. Nameer and B. Sreekumar

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WYNAAD WILDLIFE SANCTUARY



IBA Site Code	: IN-KL-24
State	: Kerala
District	: Wynaad
Coordinates	: 11° 54' 28" N, 76° 04' 36" E
Ownership	: State
Area	: 34,444 ha
Altitude	: 640 - 1,158 m
Rainfall	: 2,000 mm
Temperature	: 13 °C to 32 °C
Biogeographic Zone	: Western Ghats
Habitats	: Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Areas 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in May 1973

GENERAL DESCRIPTION

Wynaad derives its name from the numerous swamps (locally called *vayals*). Wynaad Wildlife Sanctuary is situated contiguous to the protected area network of Nagarhole and Bandipur (Karnataka) in the northeast and Mudumalai (Tamil Nadu) in the southeast. The area falls in Wynaad revenue district of Kerala as two discontinuous segments. The northern segment is the Tholpetty Wildlife Range in Manantoddy *taluka*, lying adjacent to Nagarhole National Park. The southern segment comprises of Kurichiat, Sultan's Battery and Muthanga Wildlife Ranges, lying adjacent to Bandipur Tiger Reserve and Mudumalai Wildlife Sanctuary. The total area measures 34,444 ha.

A wide area of cultivation separates the two segments. There are extensive plantations and several cultivated enclosures within the Sanctuary, constituting the major portion of the Sanctuary.

Wynaad is an extension of the Deccan plateau to the west, bounded by Coorg and Mysore in the north and east, Nilgiris in the south and Mallapuram and Calicut in the southwest. The Ghat section is separated by the Brahmagiri Dindimal ranges. The average altitude of the plateau is 700 m, but many peaks exceed 1,500 m. The only river, the Kabani, originates in the Western Ghats and flows east (Zacharias and Gaston 1997).

Wynaad Wildlife Sanctuary forms a western part of the Nilgiri Biosphere Reserve, which bears several forest types such as the Deciduous, Moist Deciduous, Semi-evergreen and Evergreen types. Wynaad is considered one of the most important wildlife sanctuaries of the Western Ghats.

The migratory paths of terrestrial wildlife of Nilgiri Biosphere Reserve end at Wynaad Wildlife Sanctuary in the northwest portion. Hence this forest is significant from the protection point of view. Wynaad receives more rain than the adjacent tracts in Karnataka and Tamil Nadu. This results in the annual mass movement of major herbivores to the Wynaad portion during the lean period. Hence, it is all the more important that Wynaad forest should be adequately protected. The Sanctuary was declared in 1973, but is being protected effectively only after bringing it under the Wynaad Wildlife Division, formed in 1985.

Moist Deciduous Forest is the climax vegetation of the area, occurring in areas with an annual rainfall of 1100-1900 mm. Except along the western edges and in a few other pockets, climatic

conditions do not favour the formation of climax evergreen vegetation. Despite the removal of teak, two Moist Deciduous forest sub-types are still discernible: forests with and without teak *Tectona grandis* in areas of lower and higher rainfall, respectively. Where teak is predominant, the forest generally attains a height of about 20 m and the canopy is more or less closed; the soil is reddish and deep, and typically supports a thin herbaceous cover. The marshes have a lush growth of grasses and the good bamboo *Bambusa arundinacea* growth occurs along their edges. Nair *et al.* (1978) provide a more detailed description of the vegetation, and lists of common tree, shrub, climber and grass species.

AVIFAUNA

Two hundred and seventy five bird species have been reported from Wynaad district (Zacharias and Gaston 1997). Nine of the species are endemic to the Western Ghats, and several others have disjunct distribution in the Indian subcontinent. Of the resident species, 41 are confined to evergreen and semi-evergreen biotopes and 66 occur only in deciduous biotopes. A total of 150 species show evidence of breeding, including the rarely recorded Ceylon Frogmouth *Batrachostomus moniliger*. Nineteen species had not previously been recorded breeding in Kerala, including the Asian Brown Flycatcher *Muscicapa dauurica*, a species previously believed to be only a winter visitor (Zacharias and Gaston 1997).

The endemic White-cheeked Barbet *Megalaima viridis* is commonly seen in the Sanctuary.

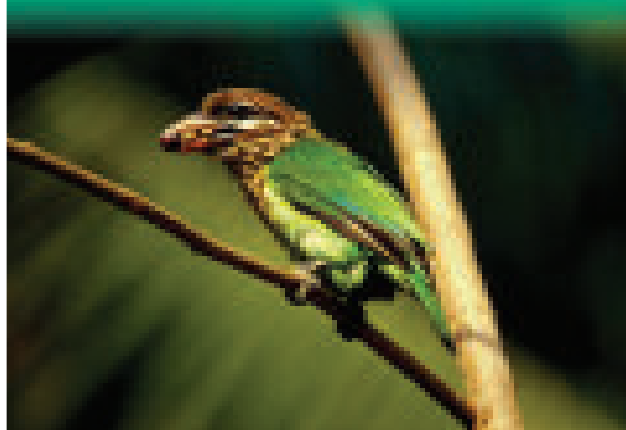


Photo: Clement Francis M.

By comparing their study results with a previous survey of Davison (1883), Zacharias and Gaston (1997) found evidence of decline of 20 species, and 17 species were not seen at all.

Wynaad lies in the Western Ghats Endemic Bird Area (EBA). In this EBA, Stattersfield *et al.* (1998) have identified 16 restricted range or endemic species. All the 16 species are found here. This is one of the few IBAs in the Western Ghats where every restricted range species is found.

Uthaman (1993) had seen a Lesser Kestrel *Falco naumanni* in December 1991, but no further details are available. Zacharias and Gaston (1997) also list this species.

Beside the restricted range species, this site also has two Critically Endangered *Gyps* species of vultures, and five globally threatened species. If we include the Near Threatened species, the list would increase further.

This is one of the few sites where the Wood Snipe *Gallinago nemoricola* has been confirmed. Zacharias and Gaston (1997) in their paper writes “common” in the table, although the text implies that the species was “uncommon or rare” at all sites visited by them (BirdLife International 2001). The Broad-tailed Grass-Warbler or Grassbird *Schoenicola platyura* was considered as “uncommon” by Zacharias and Gaston (1999) in the Wynaad Ghats. Another globally threatened species found here is the Nilgiri or Rufous-breasted Laughingthrush *Garrulax cachinnans*. Zacharias and Gaston (1993) found it as a rare resident in Wynaad district.

Interestingly, the globally Vulnerable White-winged Black Tit or Pied Tit *Parus nuchalis*, a bird of dry scrub forest, is also reported from here, especially in those portions that fall in the Deccan plateau zone.

BirdLife International (undated) has categorized species according to their biome assemblages. This site falls in Biome-10 (Indian Peninsula Tropical Moist Forest), in which 15 species are considered as representative of this biome. Except for the Jerdon’s Nightjar *Caprimulgus atripennis*, all other species are found here. Probably, this nightjar was missed by Zacharias and Gaston (1997) as it is quite widely distributed, especially in drier areas, which are present in Wynaad.

Indian Grey Hornbill is one of the Biome-11 species.

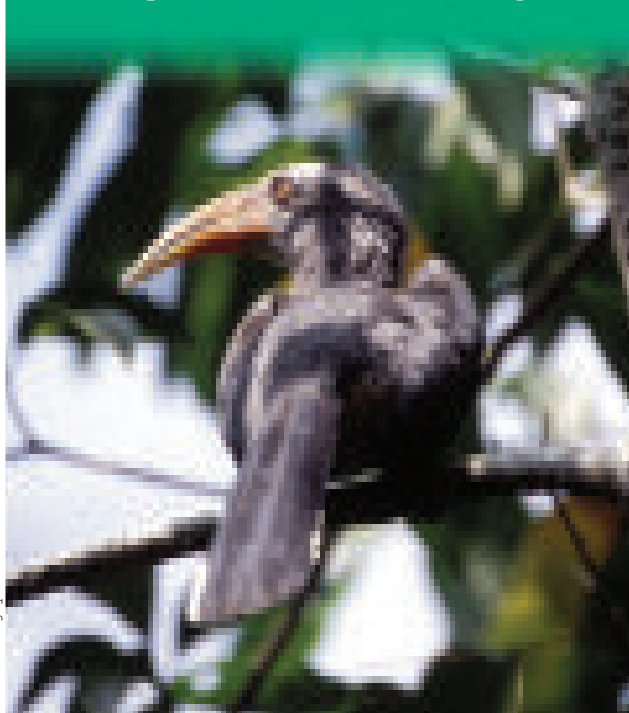


Photo: R. Vijaykumar Thoradaman

This IBA is also an important wintering site for many forest birds of the temperate and tropical forest zones of the Himalayas. The list is too long to be mentioned here (see Zacharias and Gaston 1997).

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Lesser Kestrel	<i>Falco naumanni</i>
Wood Snipe	<i>Gallinago nemoricola</i>
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
Pallid Harrier	<i>Circus macrourus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>
Malabar Pied Hornbill	<i>Anthraceros coronatus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Endemic Bird Areas 123: Western Ghats	
Nilgiri Wood-Pigeon	<i>Columba elphinstonii</i>
Blue-winged Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocyrceros griseus</i>
Nilgiri Pipit	<i>Anthus nilghiriensis</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Shortwing	<i>Brachypteryx major</i>
Wynaad Laughingthrush	<i>Garrulax delesserti</i>
Nilgiri Laughingthrush	<i>Garrulax cachinnans</i>
Grey-breasted Laughingthrush	<i>Garrulax jerdoni</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>
Black-and-Orange Flycatcher	<i>Ficedula nigrorufa</i>
Nilgiri Flycatcher	<i>Eumyias albicaudata</i>
White-bellied Blue-Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Nectarinia Minima</i>
White-bellied Treepie	<i>Dendrocitta leucogastra</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Ceylon Frogmouth	<i>Batrachostomus moniliger</i>
Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Pied Hornbill	<i>Anthraceros coronatus</i>
Crimson-throated Barbet	<i>Megalaima rubricapilla</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>
Hill Swallow	<i>Hirundo tahitica</i>
Yellow-browed Bulbul	<i>Iole indica</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Black-headed Babbler	<i>Rhopocichla atriceps</i>
Loten’s Sunbird	<i>Nectarinia lotenia</i>
Black-throated Munia	<i>Lonchura kelaarti</i>

OTHER KEY FAUNA

Wynaad Wildlife Sanctuary is famous for its large mammals. Almost all the species of the Western Ghats are seen here, but the most famous ones are the Asian Elephant *Elephas maximus*, the

Gaur *Bos gaurus*, the Nilgiri Langur *Trachypithecus johni*, the Tiger *Panthera tigris*, the Leopard *Panthera pardus* and the Indian Wild Dog *Cuon alpinus*. Thomas *et al.* (1997) have recorded 44 species of reptiles, of which 12 are considered to be endangered.

LAND USE

- q Nature conservation and research
- q Forestry
- q Tourism

THREATS AND CONSERVATION ISSUES

- q Firewood collection
- q Grazing

The most disturbing feature of Wynaad Wildlife Sanctuary is the large number of settlements with cultivation. The Southern Ranges have 80 settlements and Tholpetty Range has 9. The settlements in Southern Ranges are confined to the Moist Deciduous Forests. People have occupied almost all the *vayals* with perennial water sources. A population of more than 25,000 people live in and around the Protected Area. The main occupation is agriculture, for cash crops such as coffee, pepper and coconut, followed by primary crops paddy, ginger, tapioca and plantations. Electric fencing, provided by the Forest Department, protects few settlements. A total of 166 km length of electric fencing has been erected in the IBA to prevent crop damage by wild animals.

Livestock holdings are confined mostly to goats and cattle. These animals are mostly left to feed inside the sanctuary. Cattle lifting by Leopard and Tiger are not uncommon.

KEY CONTRIBUTOR

The IBA Team

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