



AN OVERVIEW OF THE ENVIRONMENTAL AND ECOLOGICAL IMPORTANCE OF VEDANTHANGAL BIRDS SANCTUARY, CHENGALPATTU DISTRICT



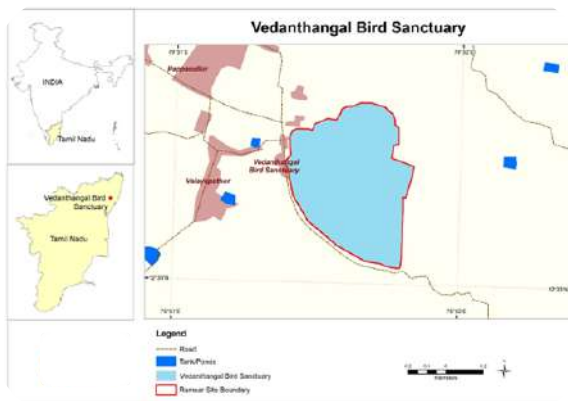


Vedanthangal Bird Sanctuary situated in the Maduranthagam Taluk of Chengalpattu District, Tamil Nadu ($12^{\circ}28'54''N$, $79^{\circ}51'6''E$) is one of India's oldest and most significant protected avian habitats. Spanning approximately 30 hectares, the sanctuary centres on the Vedanthangal irrigation tank. Its historical status as a protected area was formally recognised in 1998 when it was declared a Bird Sanctuary and its global importance was affirmed in 2022 with its designation as a Ramsar Site (No. 2477). The sanctuary is a critical wintering ground for migratory birds, making it a site of paramount importance for ornithology, conservation and eco-tourism.



SITE DESCRIPTION AND TOPOGRAPHY

The sanctuary is a low-lying wetland ecosystem situated approximately 122 meters above mean sea level and 48 kilometres inland from the Bay of Bengal. The sanctuary covers an area of 73.06 acres (29.5 hectares) comprising a central irrigation tank (Vedanthangal Lake) and its surrounding catchment zone.



The landscape is characterised by a pediplain with gentle slopes, featuring rocky plains and denuded hillocks and soil is mainly alluvial and clayey with a fertile guano layer, capable of retaining water, thereby sustaining the wetland habitat throughout the migratory season. The vegetation is dominated by key tree species, such as *Barringtonia acutangula* and *Acacia nilotica*, on the tank bunds, which provide essential nesting sites. Additionally, aquatic and herbaceous plants like *Marsilea minuta* and *Phyllanthus nodiflorus* are found within the tank itself.

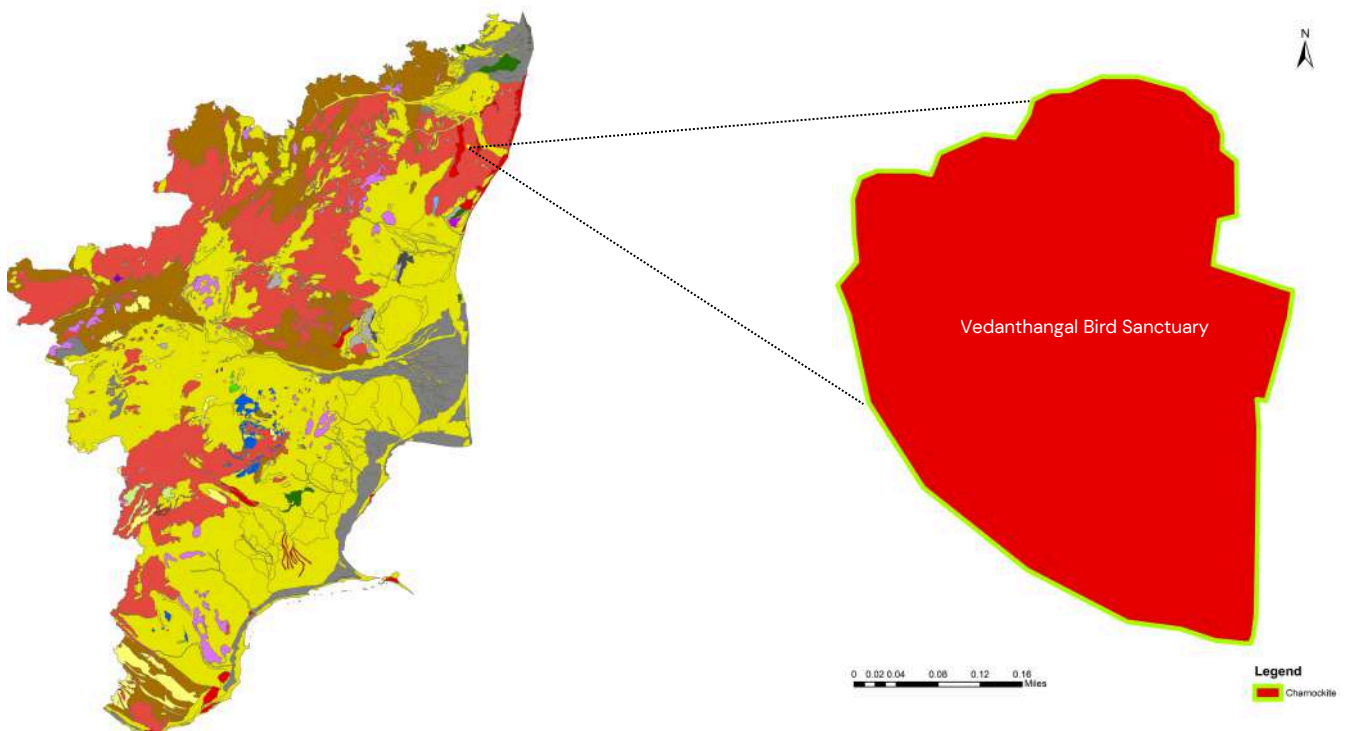




The Geology of this region is predominantly influenced by the Archaean crystalline basement complex interspersed with younger alluvial deposits.

Rock Formation: The sanctuary and its surrounding area are underlain by Archaean granites, gneisses and charnockites, which form the hard crystalline basement.

Geomorphology: The landscape is largely pediplain with gentle slopes, gradually draining towards the Vedanthangal irrigation tank at the centre of the sanctuary. The catchment area consists of weathered mantle soils derived from granitic and gneissic rocks.



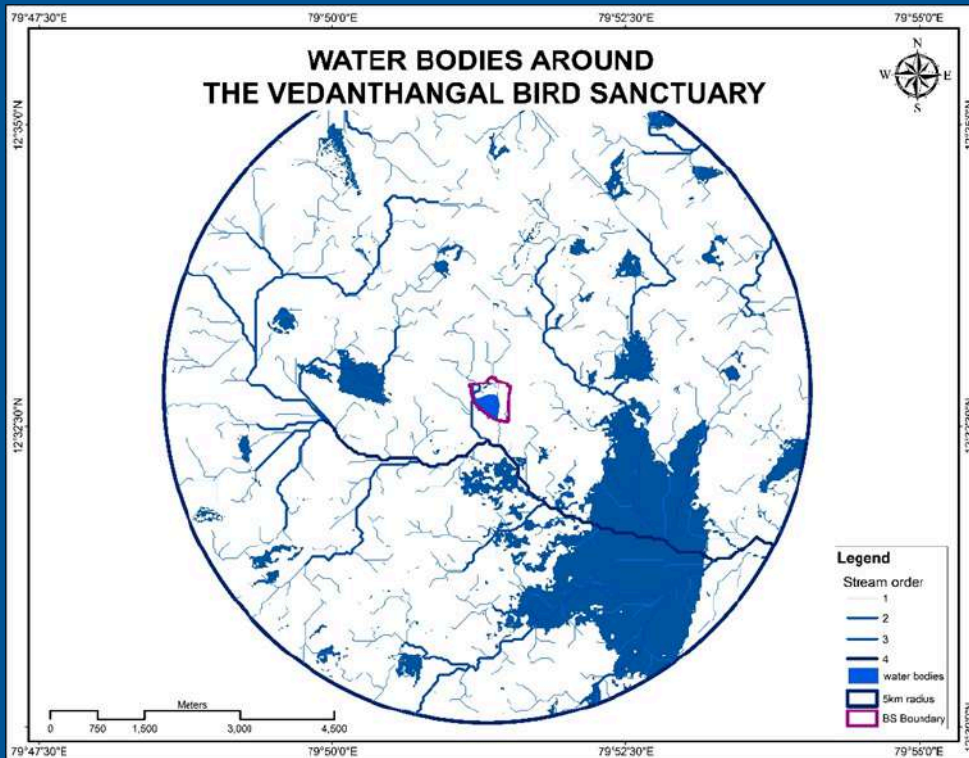
GEOLOGY

ENVIRONMENTAL SIGNIFICANCE

HYDROLOGICAL SERVICES

As part of the Palar River Basin, the sanctuary lake acts as a natural rainwater reservoir. It captures monsoon runoff, regulates surface water flow, mitigates flooding and facilitates groundwater recharge through percolation into the underlying fractured aquifers. This function is vital for sustaining irrigation and domestic water supplies in the surrounding villages.

Aquifer and Groundwater: The underlying fractured crystalline rocks combined with alluvial cover, act as moderate aquifers. The lake recharges groundwater in the surrounding villages, while the water-retaining clay-rich topsoil supports the persistence of the wetland.





CLIMATE REGULATION AND CARBON SEQUESTRATION

The sanctuary extensive waterbody and tree cover contribute significantly to micro-climate regulation. The presence of water and vegetation lowers the local temperature, increases humidity and creates a favourable environment for both wildlife and humans. The aquatic plants, trees such as *Barringtonia acutangula* and *Acacia nilotica* and the wetland ecosystem collectively act as a carbon sink, sequestering atmospheric carbon dioxide. This helps in mitigating the effects of climate change while maintaining ecological stability at the regional level.

NUTRIENT CYCLING AND POLLUTION CONTROL

Wetlands are often referred to as the “kidneys of the landscape” and Vedanthangal is a prime example. It serves as a natural purifier by trapping silt, filtering suspended particles and absorbing excess nutrients carried by surface runoff. The wetland also supports microorganisms and aquatic vegetation that break down organic matter and pollutants, thereby improving water quality and also a notable feature is the "liquid guano effect," where nutrient-rich bird droppings (guano) enrich the water, enhancing aquatic productivity and agricultural fertility in the surrounding landscape.



SOCIO-ECONOMIC SUPPORT

The sanctuary is intrinsically linked to local livelihoods. It supports fisheries through fish breeding, enhances agricultural productivity and drives a thriving eco-tourism industry. This provides direct and indirect employment for guides, vendors, and transport operators, creating a sustainable economic model based on conservation.

ECOLOGICAL SIGNIFICANCE

**Ramsar Site
Designation**

**Habitat for
Migratory Birds**

**Biodiversity
Conservation**

**Community
Outreach**

**Vedanthangal
Bird Sanctuary**



RAMSAR SITE DESIGNATION



This is to certify that

Vedanthangal Bird Sanctuary

has been designated as a

Wetland of International Importance

and has been included in the
List of Wetlands of International Importance
established by Article 2.1 of the Convention.
This is site No. 2477

Designation: 08 April 2022

Martha Rojas Urrego
Secretary General
Convention on Wetlands

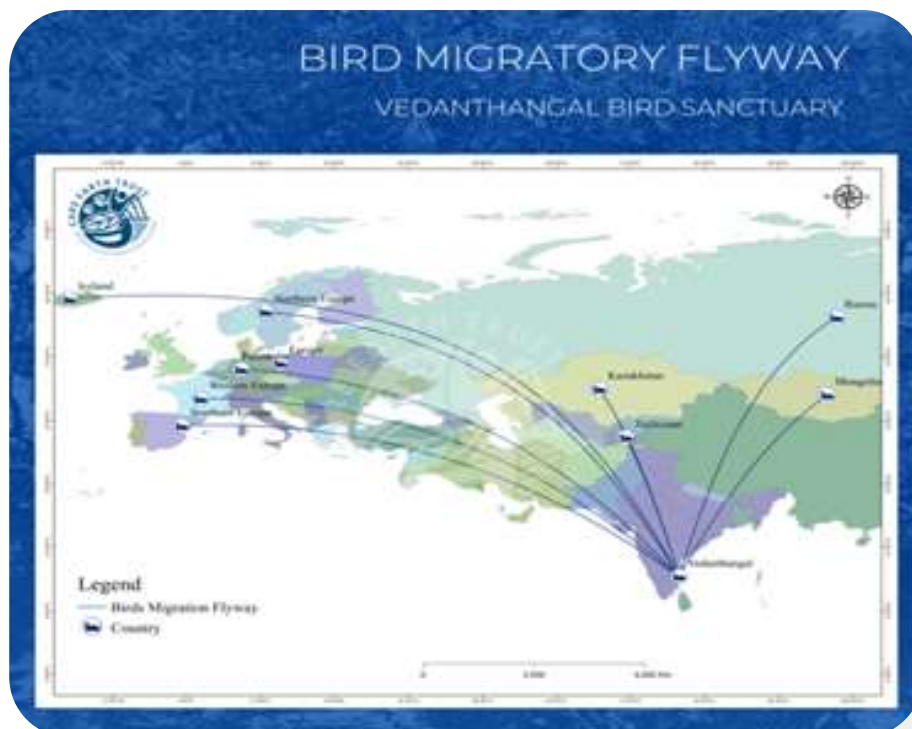
The 2022 Ramsar designation underscores the sanctuary's global importance. It meets criteria for supporting vulnerable species, maintaining biodiversity, and hosting over 1% of the population of specific waterbird species. It serves as a vital node in the Central Asian Flyway.



HABITAT FOR MIGRATORY BIRDS |



The sanctuary is a crucial breeding, nesting, and wintering ground. It hosts large, concentrated congregations of over 40,000 birds from more than 20 species annually. Key migratory species arrive from August to September from regions like Siberia, Russia, and Europe. Prominent residents and migrants include Spot-billed Pelicans (*Pelecanus philippensis*), Painted Storks (*Mycteria leucocephala*), Cormorants, Egrets, and Herons.



BIODIVERSITY CONSERVATION

Beyond birds, the ecosystem supports a diverse community of aquatic flora and fauna including fish, amphibians, reptiles in the surrounding 5 km buffer zone. The interdependence between birds and fish populations enhances the productivity of the ecosystem. The tank mainly has Barringtonia acutangula & Acacia nilotica tree species and also Common herbaceous plants in the marshy areas include Coldenia procumbens, Echinochloa colonum.



COMMUNITY OUTREACH



Community outreach activities in Vedanthangal Bird Sanctuary focus on promoting ecotourism, tree plantation and cleanup drives with the active participation of local residents, school and youth groups. These initiatives aim to maintain cleanliness, protect bird habitats and create sustainable livelihood opportunities for the local community, thereby fostering a sense of responsibility and long-term conservation awareness.

CONCLUSION

Vedanthangal Bird Sanctuary represents a paradigm of successful coexistence between human communities and biodiversity. Its environmental role in hydrological and climate regulation, combined with its ecological significance as a Ramsar-designated habitat for myriad species, highlights its indispensable value. The sanctuary is not merely a refuge for birds but a complex, functioning ecosystem that sustains local livelihoods, preserves genetic diversity and serves as a benchmark for community-involved conservation. Its continued protection is essential for maintaining regional ecological integrity and the well-being of the human populations that depend on its services.