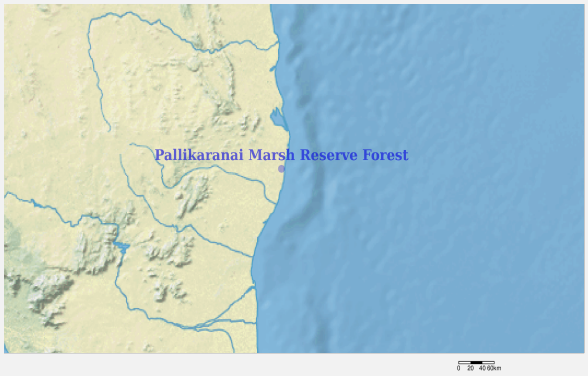
Ramsar Information Sheet

Published on 25 July 2022

India

Pallikaranai Marsh Reserve Forest



Designation date	8 April 2022
Site number	2481
Coordinates	12°55'40"N 80°13'13"E
Area	1 247,54 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

Pallikaranai wetland is a freshwater marsh in the city of Chennai, India. It is situated adjacent to the Bay of Bengal, about 20 kilometres south of the city centre, and has a geographical area of 1247.54 ha. The marshland is located along the Coromandel Coast south of the Adyar Estuary, serving as an aquatic buffer of the flood-prone Chennai and Chengalpattu districts. It is surrounded by the expressway of Old Mahabalipuram Road and the residential areas of Perungudi, Siruseri, Pallikaranai, Madipakkam, Velachery and Taramani.
The heterogeneous ecosystem of the marshland support faunal groups such as birds, fishes, and reptiles are the most prominent. Pallikaranai marsh is home to 115 species of birds, 10 species of mammals, 21 species of reptiles, 10 species of amphibians, 46 species of fishes, 9 species of molluscans, 5 species of crustaceans, and 7 species of butterflies. It is also home to some of the most endangered reptiles such as Russell's viper and birds such as the glossy ibis, grey-headed lapwings, and Pheasant-tailed jacana. Cormorants, darters, herons, egrets, open-billed storks, spoonbills, white ibis, little grebe, Indian moorhen, black-winged stilts, purple moorhens, warblers, coots, and dabchicks have been spotted in large numbers in the marshland.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency: Tamil Nadu State Wetland Authority

Postal address:
O/o Additional Principal Chief Conservator of Forests &
Member Secretary
No.1, Jeenis Road, Panagal Building, VIII Floor, Saidapet,
Chennai 600 015, Tamil Nadu, INDIA

National Ramsar Administrative Authority

Institution/agency: Ministry of Environment, Forest and Climate Change

Postal address:
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhavan, Jorbagh Road
New Delhi - 110 003 INDIA

2.1.2 - Period of collection of data and information used to compile the RIS

From year: 2001

To year: 2020

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish): Pallikaranai Marsh Reserve Forest

Unofficial name (optional): Kazhuveli (local name)

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<1 file(s) uploaded>

Former maps: 0

Boundaries description

It falls under Perungudi and Pallikaranai villages in the Kancheepuram district of Tamil Nadu, which is about 20km south of the Chennai metropolitan city. The wetland runs along the old Mahabalipuram road parallel to the Buckingham Canal throughout its length. The marsh is situated adjacent to Velachery also known as Vedashreni, a rapidly developing residential area in southwest Chennai. While Velachery is located towards the northwest of this marsh, Taramani is towards the north, Perungudi to the northeast, Madipakkam to the west, Perumbakkam to the southwest, and Sholinganallur towards the southeast. The wetland at Pallikaranai is an extensive low-lying area, covered by a mosaic of aquatic grass species, scrub, marsh, and water-filled depressions. The wetland adjoins the south Chennai aquifer that runs parallel to the old Mahabalipuram Road.

2.2.2 - General location

a) In which large administrative region does the site lie? Chennai City

b) What is the nearest town or population centre? Chennai City

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes ○ No ◉

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes ○ No ◉

2.2.4 - Area of the Site

Official area, in hectares (ha): 1247.537

Area, in hectares (ha) as calculated from GIS boundaries: 1247.537

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Udvardy's Biogeographical Provinces	Biogeographic province of Coromandel coast of the Indo- Malayan Realm (Udvardy, 1975)
Freshwater Ecoregions of the World (FEOW)	Southeastern ghats-716

Other biogeographic regionalisation scheme

Pallikaranai marsh lies in the South India and Sri Lanka marine ecoregion, West and south Indian shelf province of Western Indo-Pacific realm (Kumar et al. 2020)

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

☑ Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided	Pallikaranai Marsh acts as a sponge absorbing excess stormwater runoff from surrounding areas in the city of Chennai. The adjoining wetlands discharge water into it either as an overflow or through a drainage network. Moreover, about 54 large and small satellite man-made waterbodies are located around Pallikaranai marsh, which releases surplus water during monsoons. Therefore the existence of the marsh is linked to the sustenance of these satellite wetlands. Along with the associated wetland complex, it is part of a watershed spread over an area of 231 km. East coast is another distinct smaller watershed. Buffering the two is a third watershed of 10 km2 rendering historical connectivity to Adyar river. Pallikaranai Marsh collects floodwater thereby playing a vital role in recharging groundwater levels in the landscape. Parameswari et al (2012) showed that the water level in the marshy area is two meters above groundwater level and creates a hydraulic gradient, recharging groundwater with marshy water. Chennai is a water-scarce city and has the lowest per capita availability of water among the four Indian metro cities. Extreme intense rainfall coupled with climate change leads to increased runoff, not alleviating water stress but leading to enhanced flooding if excess water is not stored. In this context, the marsh performs the essential hydrological function of a sponge soaking up water during wet periods and releasing it during dry periods.
Other ecosystem services provided	Other ecosystem services are provisional and supportive in nature. Pallikaranai marsh supports 18 listed species of international conservation significance. It is also a habitat for numerous fauna listed under Schedule, I, II, III and IV of the Indian Wildlife Protection Act, 1972. The marsh is also an indirect source of drinking water, for people living around the marsh. It is reported that more than 700-800 tankers extract water from within 3 km of Pallikaranai marsh either by directly pumping out water or through bore wells, an obvious outcome of the recharge of ground water effectuated by the wetland. Pallikaranai marsh was also a source of income for many locals. According to Subramanian (2000, unpublished) inhabitants of seven villages, namely Pallikaranai, Taramani, Velachery, Perungudi, Perumbakkam, Thoraipakkam, and Sholinganallur, partially depended on the wetland for subsistence. Their direct economic activities included gathering reed, fishing, grazing, and agriculture (Azeez et al. 2007). Both residential and institutional areas around the marsh benefit from Pallikaranai marsh (Vencatesan et al. 2014). Moreover, Pallikaranai marsh supports emergent plant species like Typha sp and Cyperus sp., which play a vital role in water purification. Thus the wetland also provides regulating services.
Other reasons	1. Recreation site-A learning and interpretation center has been established by Tamil Nadu Forest Department within the marsh. Additionally there are observation decks, such as an elevated bridge and watch towers fully equipped with binoculars, maintained by the government. There is also a multipurpose space for holding meetings, community workshops, school programs, etc. 2. Aesthetic value- While livelihood options have been limited, subsequent to the declaration of the marsh as a Reserve Forest, Pallikaranai marsh located in suburbs of Chennai city, does add to the aesthetic value of the landscape. Large scale real estate has come into the area capitalizing on the aesthetic values of the marsh. This can be viewed as an effort to enhance and or/parcel of eco-tourism development.

☑ Criterion 2 : Rare species and threatened ecological communities

☑ Criterion 3 : Biological diversity

Justification

The heterogeneous hydrology and ecology of Pallikaranai Marsh, render it one of the most diverse natural habitats of Southern Chennai. The biodiversity of Pallikaranai Marsh is typified by the presence of species representing various faunal groups, of which birds, fishes, and reptiles are the most prominent. It is the natural habitat to some of the most endangered reptiles like the Russell's viper and birds such as the glossy Ibis, pheasant tailed Jacana, etc. Overall, Pallikaranai Marsh supports an estimated 381 species of flora and fauna.165 species of birds, 10 species of mammals, 21 species of reptiles, 10 species of amphibians, 50 species of fishes, 9 species of molluscans (snails and clams), 5 species of crustaceans, and 7 species of butterflies have been reported from the area. There are eighteen species sighted here regularly, which are of global and conservation significance. About 141 species of plants, including 29 species of grass make up the floral diversity (Care Earth, 2002, 2005, 2012; 2005 Daniels, 2002). Such a high abundance of both flora and fauna is uniquely representative of the biodiversity of the Indomalayan Biogeographic realm.

☑ Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information

Pallikaranai Marsh has a diverse habitat including large and deep reservoirs with several inlets and surrounding irrigated agricultural fields, which provide good nesting and foraging habitats for birds. This diversity of habitats enables the wetland to act as an important breeding site for many species of birds and other fauna where the following species nest in large numbers: Lissemys punctata, Channa orientalis, Aquila clanga, Aythya farina, Calidris tenuirostris, Rynchops albicollis, Sterna acuticauda. Thus, the site provides suppoort to the species listed above during critical stages of their life.

☑ Criterion 6 : >1% waterbird population

Optional text box to provide further information

The site regularly supports over 1% threshhold population of Calidris subminuta, Charadrius alexandrines, Dendrocygna bicolor, Limicola falcinellus, Himantopus Himantopus, Limosa limosa, Mycteria leucocephala, and Tringa erythropus.

☑ Criterion 7 : Significant and representative fish

Justification

Fishes such as Dwarf Gourami and Chromides that are widely bred and traded worldwide for aquaria naturally occur in Pallikaranai marsh. It dominated fish diversity of Pallikaranai marsh by species that can withstand low dissolved oxygen levels during summer and other non-rainy months. Air-breathing fish and surface-feeding fish are both diverse and abundant throughout the year. Significant and representative fish species include Anguilla bengalensis, Anguilla bicolor, Trichogaster chuna, and Channa orientalis. The above-mentioned fish species are known to use the site for feeding, breeding, and migration purposes from adjoining tributaries and vice versa. Of these, two species are endemic to the biogeographic realm, while only a few are restricted to the wetland. The majority of the fish species display migration cues, we identify some as residents and the rest as migrants.

☑ Criterion 8 : Fish spawning grounds, etc.

Justification

Pallikaranai Marsh serves as feeding and spawning grounds for several fish species, such as Anguilla bengalensis, Anguilla bicolor, Trichogaster chuna, and Channa orientalis. These species periodically use (disperse/migrate) the site throughout the year to complete their life-cycle..

3.2 - Plant species whose presence relates to the international importance of the site

<no data available>

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
Others																	
CHORDATA / REPTILIA	*Lissemys punctata*	☑	☑	☐	☐	☑	☐	☐	☐				VU	☐	☐		Common
Fish, Mollusc and Crustacea																	
CHORDATA / ACTINOPTERYGII	*Anguilla bengalensis*	☐	☐	☐	☐	☐	☐	☑	☑				NT	☐	☐		Representative fish uses the wetland as a spawning ground.
CHORDATA / ACTINOPTERYGII	*Anguilla bicolor*	☐	☐	☐	☐	☐	☐	☑	☑				NT	☐	☐		Representative fish uses the wetland as a spawning ground.
CHORDATA / ACTINOPTERYGII	*Channa orientalis*	☑	☑	☐	☐	☑	☐	☑	☑				VU	☐	☐		Vulnerable and needs protection.
CHORDATA / ACTINOPTERYGII	*Trichogaster chuna*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		Representative fish uses the wetland as a spawning ground.
Birds																	
CHORDATA / AVES	*Aquila clanga*	☑	☑	☐	☐	☑	☐	☐	☐	10	2017	0.2	VU	☐	☑	Listed under Appendix II, of both CITES and CMS	Contributes to more than 20000 waterbird species and is representative of the biodiversity of the realm.
CHORDATA / AVES	*Aythya ferina*	☑	☑	☐	☐	☐	☐	☐	☐	1000	2019		VU	☐	☐	Listed under Appendix II of CMS	Vulnerable
CHORDATA / AVES	*Calidris subminuta*	☐	☐	☑	☐	☐	☐	☐	☐	500	2016	2	LC	☐	☐	Listed under Appendix II of CMS	2% of the known Siberian population of the species
CHORDATA / AVES	*Calidris tenuirostris*	☑	☑	☐	☐	☑	☐	☐	☐	30	2019	0.3	EN	☐	☑	Listed under Appendix II of CMS	Migratory water bird using Central Asian Flyway
CHORDATA / AVES	*Charadrius alexandrinus*	☐	☐	☑	☐	☐	☐	☐	☐	800	2016	1.1	LC	☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population
CHORDATA / AVES	*Dendrocygna bicolor*	☐	☐	☑	☐	☐	☐	☐	☐	1500	2016	3	LC	☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population
CHORDATA / AVES	*Himantopus himantopus*	☐	☐	☑	☐	☐	☐	☐	☐	2000	2019	1.2	LC	☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population
CHORDATA / AVES	*Limicola falcinellus*	☐	☐	☑	☐	☐	☐	☐	☐	800	2019	1.3		☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population
CHORDATA / AVES	*Limosa limosa*	☐	☐	☑	☐	☐	☐	☐	☐	1200	2017	1.2	NT	☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population
CHORDATA / AVES	*Mycteria leucocephala*	☐	☐	☑	☐	☐	☐	☐	☐	750	2016	3	NT	☐	☐		>1 of the known South Asian population
CHORDATA / AVES	*Rynchops albicollis*	☑	☑	☐	☐	☑	☐	☐	☐	5	2020	0.001	EN	☐	☐		One of the highly endangered birds of India, can be found in the marsh
CHORDATA / AVES	*Sterna acuticauda*	☑	☑	☐	☐	☑	☐	☐	☐	10	2017	0.1	EN	☐	☐		Rare. The marsh being in close proximity to the coast, is the ideal grounds for this predominant sea bird
CHORDATA / AVES	*Tringa erythropus*	☐	☐	☑	☐	☐	☐	☐	☐	900	2016	4	LC	☐	☐	Listed under Appendix II of CMS	>1% of the known South Asian population

1) Percentage of the total biogeographic population at the site

3.4 - Ecological communities whose presence relates to the international importance of the site

<no data available>

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

Pallikaranai Marsh is part freshwater, and part saline wetland located adjacent to the Bay of Bengal in the City of Chennai, Tamil Nadu. The topography of the marsh is such that it always retains some storage. The heterogeneous hydrology and ecology of Pallikaranai make the marsh one of the most diverse natural habitats in the country. The marsh is part of the Central Asian flyway, is a designated Key Biodiversity Area for Freshwater Ecosystems by the IUCN, is an Important Bird Area for its records of the Glossy Ibis and is one of the 94 Prioritised Wetlands of the National Wetlands Conservation and Management Programme of Government of India. The biodiversity of Pallikaranai marsh is characterized by species representing diverse faunal groups, of which birds, fishes, and reptiles are the most prominent. Pallikaranai marsh along with surrounding wetlands is vital for Chennai city as a means of adapting to climate change. The heavy inflow of freshwater each year and the influence of brackish tidal water has limited the vegetation to herbaceous plants like salt-tolerant sedges (Cyperaceae) and grasses. Surface runoff from almost all sides, tidal influence from the south and southwest and dense growth of emergent aquatic plants have balanced siltation, creating extensive mudflats and wide sediment banks that border the shallow water. The following habitat types are typical of the marsh:
i. Open water pockets attract diving waterbirds such as darters, cormorants, grebes, and some ducks which dive to feed on benthic fauna like Invertebrates or aquatic vegetation.
ii. Islands and mounds are used as breeding sites by ground-nesting birds. Grasses have been planted on the mounds to provide suitable habitat for ducks like teals and pintails. Raised mounds have been created to ensure better survival rates during the long inundation periods. Grasses have been planted on these mounds to provide suitable habitats for ducks like teals and pintails.
iii. Shallow waters and mudflats are rich feeding areas for a range of migratory waders who probe the water and flats for tiny animals. Larger waterbirds with long legs and bills such as the egret, pelican, heron, flamingo, etc. can be found in the shallows probing, spearing, sieving and scooping for food.
iv. Emergent sedges, reeds, and grassy bank areas attract many wading birds. Vegetation of this type provides cover for waterbirds. Ducks, moorhens, and coots also use open water for feeding in emergent vegetation and grassy bank areas. Ibis, herons, and swamp hens are also attracted to fringing sedges as feeding areas.
v. Flooded live and dead timber is used for nesting, perching, and roosting. Cormorants use these structures for drying their wet wings.
vi. Pallikaranai marsh also acts as a foraging ground for migratory birds. A copious supply of benthic food attracts shore and wading birds. Air and surface breathing fishes are abundant throughout the year.
Overall, Pallikaranai Marsh supports an estimated 381 species of flora and fauna.165 species of birds, 10 species of mammals, 21 species of reptiles, 10 species of amphibians, 50 species of fishes, 9 species of molluscans (snails and clams), 5 species of crustaceans, and 7 species of butterflies have been reported from the area. There are eighteen species sighted here regularly, which are of global and conservation significance. About 141 species of plants, including 29 species of grass make up the floral diversity (Care Earth, 2002, 2005, 2012; 2005 Daniels, 2002). Apart from its biodiversity value, the wetland also plays a vital role in the prevention of flooding by acting as a buffer for the city of Chennai. The marsh performs the essential hydrological function of a sponge soaking up water during wet periods and releasing it during dry periods. Inhabitants of seven villages, namely Pallikaranai, Taramani, Velachery, Perungudi, Perumbakkam, Thoraipakkam and Sholinganallur, partially depended on the wetland for subsistence.

4.2 - What wetland type(s) are in the site?

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
H: Intertidal marshes	Kazhuveli	2	694.88	Representative

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Saline, brackish or alkaline water > Marshes & pools >> Ss: Seasonal/ intermittent saline/ brackish/ alkaline marshes/ pools	Kazhuveli	1	552.66	Representative

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Scrub forest, pastoral land, fallow land, residential plots, few institutions	

(ECD) Habitat connectivity	Surrounding landscape-mostly encroached construction, shrinking water-spread; coastal plain, intermittent overlapping habitats (cultivation/scrub forests); is part of-Chennai-Adyar river basin; water-washed rocks indicate historical river connectivity

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/LILIOPSIDA	*Aponogeton natans*	Dicot; Strict hydrophytes, help in stabilizing ecosystems and benefit associated fauna
TRACHEOPHYTA/LILIOPSIDA	*Cynodon barberi*	Endemic grass
TRACHEOPHYTA/LILIOPSIDA	*Habenaria amplifolia*	Rare
TRACHEOPHYTA/LILIOPSIDA	*Iseilema anthephoroides*	Endemic grass
TRACHEOPHYTA/LILIOPSIDA	*Ottelia alismoides*	Dicot; Strict hydrophytes, help in stabilizing ecosystems and benefit associated fauna

Invasive alien plant species

Phylum	Scientific name	Impacts
TRACHEOPHYTA/MAGNOLIOPSIDA	*Alternanthera philoxeroides*	Actual (major impacts)
TRACHEOPHYTA/LILIOPSIDA	*Eichhornia crassipes*	Actual (major impacts)
TRACHEOPHYTA/LILIOPSIDA	*Lemna aequinoctialis*	Actual (major impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Leucaena leucocephala*	Actual (minor impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Macroptilium atropurpureum*	Actual (minor impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Macroptilium lathyroides*	Actual (minor impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Mitracarpus hirtus*	Actual (minor impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Parthenium hysterophorus*	Actual (major impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Prosopis juliflora*	Actual (major impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Turnera ulmifolia*	Actual (major impacts)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Xanthium strumarium*	Actual (minor impacts)

Optional text box to provide further information

The plant species include some exotic floating vegetation such as, water hyacinth and water lettuce, which are less extensive and highly localized. A number of edible aquatic plants are found in the marsh like Amaranthus viridis, Amaranthus spinosus, Cucumis melo, etc. Medicinal plants have
also been recorded from the marsh like Hygrophila auriculata, Mollugo oppositifolia, Eclipta prostrata, Cressa cretica, Mukia maderaspatana, Ricinus communis, Phyllanthus maderaspatensis, Pedalium murex, Solanum surattense, etc

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	*Accipiter badius*	80	2019	0.9	IUCN(LC) and Listed under Appendix II, of both CITES and CMS
CHORDATA/AVES	*Acrocephalus agricola*	150	2018	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Acrocephalus dumetorum*	300	2017	0.9	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Acrocephalus stentoreus*	200	2019	0.5	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Anas penelope*				Listed under Appendix II of CMS
CHORDATA/AVES	*Anhinga melanogaster*	70	2016	0.7	IUCN (NT)
CHORDATA/AVES	*Anthus campestris*	150	2018	0.5	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Anthus godlewskii*	200	2016	0.9	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Anthus richardi*	200	2019	0.5	IUCN (LC) and Listed under Appendix II of CMS

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	*Anthus rufulus*	1200	2016		Commonly occurring terrestrial bird
CHORDATA/AVES	*Aquila hastata*	20	2016	0.5	Listed under Appendix II of CITES
CHORDATA/AVES	*Ardea alba*	500	2019	0.9	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Athene brama*	60	2016	0.8	IUCN (LC) and Listed under Appendix II of CITES
CHORDATA/MAMMALIA	*Axis axis*	10	2015	0.1	Once common in the marsh, but now almost rarely sighted and confined only to Guindy National Park and adjacent areas
CHORDATA/AVES	*Butastur teesa*	60	2016	0.8	IUCN (LC) and Listed under Appendix II, of both CITES and CMS
CHORDATA/AVES	*Calidris alpina*	700	2019		Commonly occurring
CHORDATA/AVES	*Calidris canutus*	50	2018	0.5	IUCN (NT) and Listed under Appendix II of CMS
CHORDATA/AVES	*Calidris ferruginea*	500	2017	0.5	IUCN (NT) and Listed under Appendix II of CMS
CHORDATA/AVES	*Calidris minuta*	1800	2019	1	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Calidris temminckii*	500	2019		Commonly occurring
CHORDATA/MAMMALIA	*Canis aureus*	20	2018	1	Known to be very common in 1970s and sighted in Velachery; now confined only to the adjoining Guindy National Park and rarely sighted in the marsh
CHORDATA/AVES	*Charadrius mongolus*	1200	2016	1	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Chlidonias leucopterus*	20	2016	0.01	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Ciconia ciconia*	50	2016	0.6	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Ciconia episcopus*				IUCN (NT)
CHORDATA/AVES	*Circus aeruginosus*	40	2019	0.4	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Elanus caeruleus*	50	2019		Raptor
CHORDATA/AVES	*Fulica atra*	700	2019		Common waterbird
CHORDATA/MAMMALIA	*Macaca radiata*	20	2021	0.5	Common, but now almost rare in the marsh and sighted in some pockets; population is declining
CHORDATA/AVES	*Motacilla tschutschensis*	500	2019	0.9	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Nettapus coromandelianus*	1200	2016		Commonly occurring waterfowl
CHORDATA/AVES	*Numenius arquata*	500	2017	1	IUCN (NT) and Listed under Appendix II of CMS
CHORDATA/AVES	*Numenius phaeopus*	300	2016	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Oriolus kundoo*	80	2020	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Otus bakkamoena*	30	2016	0.3	IUCN (LC) and Listed under Appendix II of CITES

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	*Pandion haliaetus*	20	2019	0.9	IUCN (LC) and Listed under Appendix II, of both CITES and CMS
CHORDATA/AVES	*Pelecanus onocrotalus*	10	2018	0.1	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Phalaropus lobatus*	300	2019	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Philomachus pugnax*	800	2016	0.5	Listed under Appendix II of CMS
CHORDATA/AVES	*Phoenicopterus roseus*				
CHORDATA/AVES	*Phylloscopus nitidus*	350	2019	0.6	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Phylloscopus trochiloides*	300	2017	0.5	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Platalea leucorodia*	400	2019	0.8	IUCN (LC) and Listed under Appendix II of CITES and CMS
CHORDATA/AVES	*Pluvialis fulva*	600	2019		Migrant. Commonly occurring shore bird / wader
CHORDATA/AVES	*Pluvialis squatarola*	400	2019	1.3	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Porzana pusilla*	110	2016	0.1	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Recurvirostra avosetta*	600	2019		Recurvirostra avosetta
CHORDATA/AVES	*Sarkidiornis melanotos*	100	2016	0.1	IUCN (LC) and Listed under Appendix II of CITES and CMS
CHORDATA/AVES	*Saxicola caprata*	300	2016	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Sterna hirundo*	80	2019	0.6	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Sternula albifrons*	40	2019	0.8	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Tadorna ferruginea*	250	2016		Commonly occurring waterfowl
CHORDATA/AVES	*Terpsiphone paradisi*	50	2019	0.5	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Thalasseus bengalensis*	250	2018	0.9	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Tringa glareola*	1500	2016	1.1	IUCN (LC) and Listed under Appendix II of CMS
CHORDATA/AVES	*Tringa nebularia*	1200	2016		Shore bird
CHORDATA/AVES	*Tringa ochropus*	1500	2016		Shore bird
CHORDATA/AVES	*Tringa stagnatilis*	2000	2016		Shore bird
CHORDATA/AVES	*Tyto alba*	20	2019	0.6	IUCN (LC) and Listed under Appendix II of CITES
CHORDATA/AVES	*Vanellus cinereus*	800	2016	0.9	IUCN (LC) and Listed under Appendix II of CMS. very high number (1400) of Greyheaded Lapwing Vanellus cinereus, a rare migrant to South India was recorded in Pallikaranai marsh
CHORDATA/AVES	*Vanellus indicus*	1500	2016	1	IUCN (LC) and LC Listed under Appendix II of CMS

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	*Vanellus malabaricus*	1200	2016	1	IUCN (LC) and LC Listed under Appendix II of CMS
CHORDATA/REPTILIA	*Varanus bengalensis*	50	2021		IUCN (NT). Common. But they are much sought after reptile for trade and meat

Invasive alien animal species

Phylum	Scientific name	Impacts
CHORDATA/ACTINOPTERYGII	*Clarias batrachus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Clarias gariepinus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Mystus cavasius*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Mystus gulio*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Mystus vittatus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Oreochromis aureus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Oreochromis mossambicus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Oreochromis niloticus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Pterygoplichthys multiradiatus*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Sperata seenghala*	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	*Trichogaster lalius*	Actual (major impacts)

Optional text box to provide further information

Catfish species listed under the Invasive species are posing a problem to the native fish species and may lead to their decline

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cwa: Humid subtropical (Mild with dry winter, hot summer)

The climate, in general ranges between dry sub-humid to semi-arid. Normal annual rainfall in the state is about 945 mm (37.2 inches), of which 48% is through the North East monsoon, and 32% through the South West monsoon. Since the state is entirely dependent on rains for recharging its water resources, monsoon failures lead to acute water scarcity and severe drought. The landscape of Chennai is typically a tropical dissymmetric climate (Meher-Homji 1974). The mean annual maximum and minimum temperatures are 32.9°C and 24.3°C. The mean annual rainfall is 1215 mm. Catchment area of Pallikaranai marsh is subjected to various ecological and natural disturbances like cyclones, floods, and drought. These ecological disturbances directly or indirectly influence the wetland environment.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 2

a) Maximum elevation above sea level (in metres): 4

- Entire river basin ☐
- Upper part of river basin ☐
- Middle part of river basin ☐
- Lower part of river basin ☑
- More than one river basin ☐
- Not in river basin ☐
- Coastal ☐

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Pallikaranai marsh falls under the Adayar River Basin (Chennai River Basin). However it is adjacent to “Bay of Bengal” sea

4.4.3 - Soil

Mineral ☐

Organic ☑

No available information ☐

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes ◉ No ○

Please provide further information on the soil (optional)

Soil substrate is marshy. Geological profile reveals clayey-sand up to 2m, followed by sandy-clay (2m-8m), greenish clayey layer with calcareous orange streaks (8m-11m), weathered charnokite (11m-13m) and at the bottom, charnokite is as bedrock (Parameswari et al, 2013). The sandy-clay layer has a high water-holding capacity and relatively low permeability, affecting the whole stratigraphic sequence, and reducing water percolation ability into aquifer. Clayey soil has 17% aquifer recharging capacity since the underground is a mixture of sand and clay. Vertisol is the most predominant marsh soil type, have high content of expanding clay minerals, transmit water very slowly, though tends to be fairly high in natural fertility. Soil analysis around Perungudi dumpsite revealed soil texture falling under clay loam category (clay-32%, silt-10%, sand-58%), with pH 7.11-8.66 and and conductivity of 0.58 ms/cm.

4.4.4 - Water regime

Water permanence

Presence?	
Usually seasonal, ephemeral or intermittent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	
Water inputs from surface water	☑	No change
Water inputs from precipitation	☑	No change

Water destination

Presence?	
Feeds groundwater	No change

Stability of water regime

Presence?	
Water levels fluctuating (including tidal)	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology:

Water permeance, destination as well as water regime stability increases/decreases, depending upon seasonality. Currently due to rapid urbanization around the marsh, there is a significant ground water level depletion. An interesting issue with respect to Pallikaranai is its hydrology. Geologically, the marsh being part of a floodplain, absence of historical maps prior to 1900 and inaccessibility due to dense human habitation, has rendered the question of connectivity to rivers unanswered. It is postulated that the construction of Buckingham Canal was a key feature in connecting the eastern part of wetland at Okkiyam Thoraipakkam to the Pallikaranai. The southern canal which originated in Ottiyambakam wetland and drained north through Perumbakkam has been compromised. Natural flow paths are aligned to the north, which was re oriented at some point in history.

(ECD) Connectivity of surface waters and of groundwater	Destruction of natural recharge zones (Sunderasan et al., 2015), and unregulated water extraction has resulted in groundwater level of shallow aquifers and areas within catchment area to fall below 2.21 to 7.64 m below ground level (CGWC, 2008).
(ECD) Stratification and mixing regime	Mixing of fresh& seawater is due to huge volumes of surface runoff the marsh receives during monsoons. Surface runoff, tidal influence from South &SE, dense emergent aquatic plants balance siltation creating extensive mudflats and wide sediment banks

4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site ☐

Significant accretion or deposition of sediments occurs on the site ☐

Significant transportation of sediments occurs on or through the site ☐

Sediment regime is highly variable, either seasonally or inter-annually ☑

Sediment regime unknown ☑

Please provide further information on sediment (optional):

Ecological Source Sediment (mg/g) Surface water (mg/L) Permissible
(Pallikaranai marsh) (Around Pallikaranai) limit in water (mg/L)
Al 20.0-80.0 - 0.03
Cd 0 – 0.0006 0 – 0.019 0.003
Cr 0 – 1.5 0.10 – 1.52 0.05
Cu 0.02 – 0.32 0 – 0.02 0.05
Fe 12.0 – 57.0 0 – 1.52 0.3
Hg 0.2 – 1.4 - 0.001
Zn 0 – 0.6 0.002 – 0.14 5

(ECD) Water turbidity and colour	ntu –ntu
(ECD) Light - reaching wetland	Maximum depth is -2.57m below MSL; next gradient of -2.57 to 0.58m is middle of marsh &12 m in portions near dump yard.
(ECD) Water temperature	24.3°C – 32.9°C

4.4.6 - Water pH

- Acid (pH<5.5) ☐
- Circumneutral (pH: 5.5-7.4) ☐
- Alkaline (pH>7.4) ☑
- Unknown ☐

Please provide further information on pH (optional):

Data as per analysis of Tamil Nadu Pollution Control Board (April, 2022)

4.4.7 - Water salinity

- Fresh (<0.5 g/l) ☐
- Mixohaline (brackish)/Mixosaline (0.5-30 g/l) ☐
- Euhaline/Eusaline (30-40 g/l) ☐
- Hyperhaline/Hypersaline (>40 g/l) ☐
- Unknown ☑

(ECD) Dissolved gases in water

Pallikaranai marsh is characterized by low dissolved oxygen levels during summer and non-rainy months. During Pre-monsoon season, COD ranges between 20-269 and 25-129 during post monsoon.

4.4.8 - Dissolved or suspended nutrients in water

- Eutrophic ☐
- Mesotrophic ☑
- Oligotrophic ☐
- Dystrophic ☐
- Unknown ☐

Please provide further information on dissolved or suspended nutrients (optional):

Research has shown that wetland characteristics lead to the accumulation of high amounts of organic matter in the soil, serving as carbon sink and making them one of the most effective ecosystems, accumulating soil carbon (Bernal, 2008). In a study conducted by Karpagavalli (2015), on carbon sequestration potential of Pallikaranai urban wetland, the amount of carbon annually stored by Pallikaranai marsh was calculated by multiplying the sedimentation rate measured, average organic carbon content of the sediment cores and average bulk density. The outcome provided carbon sequestration rate (CSR). Multiplying CSR by the area of wetland provided an estimate of the amount of carbon accumulated throughout the Pallikaranai wetland. The CSR of the Pallikaranai wetland was 0.1862 g C m-2y-1. Based on the area and CSR, the total (CSP) of the Pallikaranai wetland was estimated as 0.0020249 Gg C y-1(2024.9 Kg C y-1).

(ECD) Dissolved organic carbon	Chloride concentrated in 1.5-2.5m depth; Sulphate concentrated in 2-3m depth; Organic Carbon range: 654 to 5482 mg/l
(ECD) Water conductivity	630-14400 uS/cm

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself: i) broadly similar ○ ii) significantly different ◉

- Surrounding area has greater urbanisation or development ☑
- Surrounding area has higher human population density ☑
- Surrounding area has more intensive agricultural use ☐
- Surrounding area has significantly different land cover or habitat types ☑

Please describe other ways in which the surrounding area is different:

The area around Pallikaranai marsh is a mixture of high rise residential complexes, industries and institutional zones, institutions, public infrastructure, connecting radial roads, METRO and remnant natural habitats. Topographic changes brought about by construction activities have shrunk the water-spread of the marsh. Pallikaranai, Perungudi, Sholinganallur, and Perumbakkam villages surround the marshland.

S.No Classification 2010 2020
Area (km2) percent Area (km2) percent

1 Natural Vegetation 91.04 33.63 35.08 12.96
2 Builtup 97.17 35.89 145.41 53.71
3 Open Space 50.01 18.47 40.68 15.03
4 Agriculture 16.39 6.05 17.91 6.62
5 Wetland 16.11 5.95 31.64 11.69
Total Area 270.73 270.73

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	High
Fresh water	Drinking water for humans and/or livestock	High
Wetland non-food products	Other	High

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Maintenance of hydrological regimes	Storage and delivery of water as part of water supply systems for agriculture and industry	High
Erosion protection	Soil, sediment and nutrient retention	High
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climactic processes	High
Biological control of pests and disease	Support of predators of agricultural pests (e.g., birds feeding on locusts)	High
Hazard reduction	Flood control, flood storage	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Picnics, outings, touring	High
Recreation and tourism	Nature observation and nature-based tourism	High
Spiritual and inspirational	Aesthetic and sense of place values	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High
Scientific and educational	Long-term monitoring site	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	High
Soil formation	Sediment retention	High
Soil formation	Accumulation of organic matter	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High

Optional text box to provide further information

There is no central human settlement, right in the middle of the current marsh boundaries.
Owing to urbanization, people have moved in and occupied many places, thereby reducing the actual/original size of the site. Many private sector companies, institutes, and human settlements have emerged in the periphery.

Pallikaranai Town Panchayat has a population of 43,493 and is divided into 15 wards.
Perungudi town panchayat has a population of 43,111. According to a recent census, the
population of Chennai is 4646732, and expected to achieve 125.82 lakhs by 2026. Chennai city due to its proximity to Andhra Pradesh state, Pulicat Estuarine Complex, in the north and Bay of Bengal to the east, can expand only west and south. This puts Pallikaranai marsh and surrounding areas under immense pressure.

Other ecosystem service(s) not included above:

Social and cultural values

A large proportion of South Chennai was historically a floodplain, spread over 50 km2 and
comprised of Pallikaranai marsh, smaller satellite wetlands and large tracts of pasture land. The surrounding wetlands were the only source of irrigation and thrived on paddy cultivation.

Within the site: 1000s

Outside the site: 1000s

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes ◉ No ○ Unknown ○

Where economic studies or assessments of economic valuation have been undertaken at the site, it would be helpful to provide information on where the results of such studies may be located (e.g. website links, citation of published literature):

No extensive economic valuation studies undertaken; few reports/ documents identified, with respect to the site and global scenario.
https://www.mids.ac.in/assets/doc/WP_220.pdf
https://www.mse.ac.in/wp-content/uploads/2016/09/Working-Paper-126.pdf
https://archive.nyu.edu/handle/2451/44197
http://www.aliakhandayatsamaj.in/conference/conf_papers/conf_paper_37.pdf
Balakrishnan, M. (1993): “Wetlands of India: Their unique potential for Quality life improvement” Environmental Problems& Prospects in India, Oxford&IBH Publishing Co.Pvt.Ltd.New Delhi,pp21-22.
CEA (1994): Wetlands are no wastelands. A manual and strategy for conservation and development of wetland. Central Environment Authority, Euro consults, Colombo, Sri Lanka.
Franziska, S and Hörmann, G (2015): Towards Integrated Water Management of Pallikaranai Wetland in Chennai City, India Institute for Natural Resource Conservation, Hydrology and Water Resources Management, Kiel University, Germany. IGCS Bulletin, Volume 4, Issue 1, p14-18.
Janakarajan S., Butterworth S., Moriatry P., Batchelor C. (2007): Strengthened city, marginalized peri-urban villages: stakeholder dialogues for inclusive urbanization in Chennai, India.
Joshi V.U., Kale V.S. (2013): Environmental Conflicts in Coastal Metropolitan Cities in India: Case Studies of Mumbai and Chennai Metropolitan Regions. Unpublished Report. Pune University
Lavanya, Ar.K. (2012): Urban Flood Management – A Case Study of Chennai City. Architecture Research 2(6): 115-121.
Mawdsley, E (2004): India´s Middle Classe& the Environment. Development& Change,35(1),79-103.
Staff Reporter, The Hindu, 29th Nov (2006): Rise in the Number of City Dwellers Moving to Suburbs.
Turner, M.A. (2015): Transport Infrastructure, Urban Growth and Market Access in China. 55th congress of European Regional Science Association. “World Renaissance: Changing roles for people and places”, 25-28, Lisbon, Portugal

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland ☑

Description if applicable

Wise Wetland use Model

It has been proposed that Pallikaranai Marsh would be an ideal site as a public space. Two watch towers have been recently constructed by the Forest Department to make bird watching easier and binoculars are available for bird watching. A project titled “Ribbon Walk” has been proposed for Pallikaranai Marsh on the Thoraipakkam – Kizhkatalai Radial Road. It is also proposed to develop and construct a dedicated Wetland Centre at Pallikaranai Marsh, whose key features would include education, awareness, training and capacity building, research, monitoring and establishing a Local Interest Group (LIG) for enabling local community participatory management and conservation of the marsh.

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☑

Description if applicable

Social and Cultural values

A large proportion of South Chennai was historically a floodplain, spread over 50 km2 and
comprised of Pallikaranai marsh, smaller satellite wetlands and large tracts of pasture land. The surrounding wetlands were the only source of irrigation and thrived on paddy cultivation.

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples ☑

Description if applicable

Historically, the entire region was a floodplain and people practiced agriculture. This was the only water source available for south Chennai. Although the current situation has changed drastically, with the flood plain reduced to the status of a marsh land and further to a grass land, we observe and hear orally from people who had lived back then, when the area flourished, that they understand and are fully aware of the functional significance of Pallikaranai marsh, in terms of the ecosystem services.

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland ☐

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Other public ownership	☑	☑
Provincial/region/state government	☑	☑

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Commercial (company)	☑	☑

Other

Category	Within the Ramsar Site	In the surrounding area
No information available	☑	☑

Provide further information on the land tenure / ownership regime (optional):

1) Area notified as Reserve Land (G.O.Ms. No. 52 E&F dated 09.04.2007) is 317.00 ha, received from Revenue Dept. with Forest Dept. ownership.
2) G.O.Ms. No. 127 Municipal Administration & Water Supply dept. dates 24.12.2012 is 170.40 ha, received from Chennai Corporation; Forest Dept. ownership.
3) Revenue area declared U/s 26 of TNFA 1882 (Kancheepuram District Gazette No. 6 dated 01.07.2013) is 131.55 ha, received from Revenue Dept. with Forest Dept. ownership.
4) Finance city area and recently allotted to Forest Dept. (G.O.Ms. No. 147 Revenue Department dated 12.05.14) is 75.93 ha, received from Revenue Dept. with Forest Dept. ownership.

Surrounding area: Beyond the floodplain boundaries of the proposed site, lands are either under local jurisdiction of Municipal or State governments, or are under private ownership, usually individual, sometimes Corporate. Government departments include Public Works, Revenue and Municipal Corporation.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

Tamil Nadu State Wetland Authority, Forest Department, Government of Tamil Nadu

Conservation Authority of Pallikaranai Marshland, Tamil Nadu Forest Department,
Panagal Maaligai, 8th Floor, 1, Jeenis Road, Saidapet,
Chennai-600061, Tamil Nadu, India.

Provide the name and/or title of the person or people with responsibility for the wetland:

Shri. Deepak Srivastava, Additional Principal Chief Conservator of Forests & Member Secretary

Postal address:

O/o The Additional Principal Chief Conservator of Forests & Member Secretary
Panagal Maaligai, 8th Floor, 1, Jeenis Road, Saidapet,
Chennai-600061, Tamil Nadu, India.

E-mail address: tnswa18@gmail.com

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Commercial and industrial areas	High impact		☐	☑
Housing and urban areas	High impact		☐	☑
Unspecified development	High impact		☐	☑

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Water abstraction	High impact		☑	☑
Water releases	High impact		☑	☑

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Livestock farming and ranching	Medium impact		☑	☑
Non specified	Medium impact		☑	☑

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified	unknown impact		☑	☑

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Roads and railroads	High impact		☑	☑

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified	unknown impact		☑	☑

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified/others	High impact		☑	☑

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Vegetation clearance/ land conversion	High impact		☑	☑
Unspecified/others	High impact		☑	☑

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Invasive non-native/ alien species	High impact		☑	☑

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Household sewage, urban waste water	High impact		☑	☑
Industrial and military effluents	High impact		☑	☑
Garbage and solid waste	High impact		☑	☑
Air-borne pollutants	High impact		☑	☑
Excess heat, sound, light	High impact		☑	☑

Geological events

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified	Medium impact		☑	☑

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Habitat shifting and alteration	High impact		☑	☑
Droughts	High impact		☑	☑
Temperature extremes	High impact		☑	☑
Storms and flooding	High impact		☑	☑

Please describe any other threats (optional):

A study showed that nearly thirty agricultural wells located mainly on the western side of the marsh were used for extraction of groundwater by both private and municipal tankers. Development of transportation facilities all along the drainage systems, around the marsh in some areas, has also aggravated and impaired the rain water carrying capacity of the few existing water ways around the marsh. This leads to high risk of flooding.

Further to regularization of the roads that grossly interfered with the hydrology of the marsh, a disconnect had been forced upon the landscape by the presence of the ELCOT (Electronic Corporation of Tamil Nadu Ltd.) city and the road, which has severed the natural drainage and buffer provided by the adjacent Perumbakkam wetland (Vencatesan et al. 2014).

In a recent study conducted by Ramachandran. A, showed annual emission of 8.4 giga tonnes of methane, a potent greenhouse gas, from the marsh

5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Other global designation	Pallikaranai Marsh	https://www.pallikaranaimarsh.or g	whole

Regional (international) legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Other international designation	Pallikaranai Marsh	https://www.pallikaranaimarsh.or g	whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Reserve Forest	Pallikaranai Marsh	https://www.pallikaranaimarsh.or g	whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Pallikaranai Marsh	https://www.pallikaranaimarsh.or g	whole
Other non-statutory designation	Pallikaranai Marsh	http://www.wwfenvis.nic.in https://www.forests.tn.gov.in/tn forest/app/webroot/img/document/ legislations/Guidelines%20%20for %20Wetland%20Conservation%20%20a nd%20Mnagement%20in%20India.pdf	whole

5.2.3 - IUCN protected areas categories (2008)

Ia Strict Nature Reserve ☐

Ib Wilderness Area: protected area managed mainly for wilderness protection ☐

II National Park: protected area managed mainly for ecosystem protection and recreation ☐

III Natural Monument: protected area managed mainly for conservation of specific natural features ☐

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention ☐

V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation ☐

VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems ☐

<no data available>

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Hydrology management/restoration	Implemented
Soil management	Implemented
Land conversion controls	Implemented
Improvement of water quality	Implemented
Habitat manipulation/enhancement	Implemented
Re-vegetation	Implemented
Catchment management initiatives/controls	Implemented

Species

Measures	Status
Threatened/rare species management programmes	Implemented
Control of invasive alien plants	Implemented
Control of invasive alien animals	Implemented

Human Activities

Measures	Status
Management of water abstraction/takes	Partially implemented
Regulation/management of wastes	Partially implemented
Livestock management/exclusion (excluding fisheries)	Partially implemented
Fisheries management/regulation	Partially implemented
Harvest controls/poaching enforcement	Partially implemented
Regulation/management of recreational activities	Partially implemented
Communication, education, and participation and awareness activities	Partially implemented
Research	Partially implemented

Other:

India's National Action Plan for Conservation of Migratory Birds and their Habitats along Central Asian Flyway (2018-2023).

Pallikaranai is one of the 94 wetlands, identified under National Wetland Conservation and Management Programme (NWCMP) of the Government of India and also one of the prioritized wetlands of Tamil Nadu.

In 2007, the Government of Tamil Nadu, responded to the science-based advocacy programme of Care Earth and the civil society network, that was forged as part of the advocacy programme, viz. "Save Pallikaranai Marsh Forum", notified the southern portion of the marsh, spanning 317 hectares, initially as a Reserved Land and upgraded to a "Reserve Forest" under Forest (Conservation) Act, 1980.

In 2016, Forest Department cleared invasive Prosopis juliflora on the northern edge of the marsh and the dredged soil has been used to create a bund, to plant native trees.

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes ○ No ◉

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes ○ No ◉

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

More than 40 research studies have been undertaken pertaining Pallikaranai marsh (a large number of which are published as research papers, whilst others are unpublished student/intern dissertations) which are indexed and available for use at Conservation Authority. The Nature Trust has been entrusted by Conservation Authority of Pallikaranai Marshland for monitoring the bird population in Pallikaranai marsh. The survey methodology broadly follows the 'Common Bird Census' (CBC) devised by the British Trust for Ornithology (BTO). Bird census is undertaken during third week of every month in suitable weather conditions, by a well-trained team.

URL of site-related webpage (if relevant): https://www.pallikaranaimarsh.org

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water regime monitoring	Proposed
Water quality	Proposed
Soil quality	Proposed
Plant species	Proposed
Animal species (please specify)	Proposed
Birds	Proposed

Scientists advocate that ecosystem management must be flexible and be able to incorporate adjustments on the basis of continual monitoring of on-going changes. Monitoring the relative abundance of Invasive Alien species (fishes) is helpful in tracking the water quality of the marsh. Monitoring the diadromous fish and smaller cyprinid fish will be useful in understanding the salinity and DO (Dissolved Oxygen) levels of the marshland. To maintain fish diversity, habitat management is equally important. This is achieved by monitoring the depth and DO levels of the water and by making an effort to maintain connectivity with the sea and also locally within the various segments of the marshland.
The institutional control of dumping of toxic and hazardous waste materials by Perungudi Dump yard also requires a long-term monitoring, spanning 20-25 years, as a part of remediation design and implementation. This is also viewed as “Post closure Monitoring” Tree-cover within the watershed-landscape needs to be assessed and monitored.
Monitoring shifts in community organization of water birds is key to understand and effectively manage health of the marshland. The birds must also be monitored periodically for any disease outbreaks like avian flu. Regional and national monitoring of populations: Breeding locations of most waterfowl, have to be identified as part of a regular inventory.
Since 2007, the southern portion of the marsh was protected and steps were initiated to conserve through dedicated management plans, signs of revival were also witnessed. The fact that Pallikaranai Marsh is a refugium for birds, and a unique example of protecting a wetland situated in the midst of a metropolis, as also viable example of effective public – government partnership for conservation (the Conservation Authority of Pallikaranai Marsh), it is proposed to develop and construct a dedicated Wetland Centre (WC) at Pallikaranai Marsh. Key features of the Wetland Centre would include: education and awareness, training and capacity building, research and monitoring.
Guard station with fulltime staff monitoring: Monitoring the weather (eg- daily max/min temperatures), downloading the information in the database, and interpreting the findings require many student skills. Monitoring- use of early warning and rapid assessment indicators / GIS based approach.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

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Aravindkumar, J., Saravanakumar, K., Gokulakrishnan, M., &Indira, B. (2014) Assessment of Physio-Chemical Parameters of Water at Environmentally Degraded Pallikaranai Marsh Area, Chennai, India. International Journal of Scientific and Engineering Research, 5(7), 5–8
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Daniels, R.J.R (2002) Fate of the Velachery-Pallikaranai marsh of Chennai. Newsletter for Birdwatcher, 42(1):4
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Oppili, P, The Hindu, 11th January (2008): Naturalists See Red as Marshland Water Changes Colour.
Sridevi Karpagavalli, M., Malini, P and Ramachandran, A. (2012) Analysis of Heavy metal in dying wetland of Pallikaranai, Tamil Nadu, India. J. Environ. Biol, 33:757-761
Parameswari, K., Mudgal, B. V., & Nelliyat, P. (2012). Evaluation of groundwater contamination and its impact: an interdisciplinary approach. Environment, development and sustainability, 14(5), 725-744.
Udvardy Miklos, D.F (1975) A Classification of the Biogeographical Provinces of the World. IUCN (Occasional Paper No.18) prepared as a contribution to UNESCO's Man and Biosphere Programme Project No.8.
Vencatesan, J (2006) "Wastelands: Time to Rethink" Current Science, Vol. 91. No.11, dated 10th December.
Vencatesan, J (2007). "Protecting Wetlands." Current Science (00113891) 93.3: 288-90.

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<1 file(s) uploaded>

ii. a detailed Ecological Character Description (ECD) (in a national format)
<1 file(s) uploaded>

iii. a description of the site in a national or regional wetland inventory
<no file available>

iv. relevant Article 3.2 reports
<no file available>

v. site management plan
<1 file(s) uploaded>

vi. other published literature
<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:


panoramic view of Pallikaranai Marsh (*Care Earth Trust, 30-11-2021*)


Ariel View of Pallikaranai Marsh (*Care Earth Trust, 30-11-2021*)


Pallikaranai Marsh (*Care Earth Trust, 30-11-2021*)


Northern Shoveler (*Care Earth Trust, 30-11-2021*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 2022-04-08