



**EVALUATION OF THE WATERBIRDS
OF ODIYUR LAGOON – A WETLAND NEAR THE
PROPOSED CHEYYUR THERMAL POWER PLANT**

BOMBAY NATURAL HISTORY SOCIETY

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INTRODUCTION

Being chronically deficient in power, the Government of India launched an ambitious plan to establish a series of power plants to enhance generation capacity, under the Ultra Mega Power Projects (UMPP) programme. In this regard, the Ministry of Power, in association with the Central Electricity Authority and Power Finance Corporation Limited, launched an initiative for the development of coal-based UMPPs in India, which are to be awarded to developers on the basis of competitive bidding. Sixteen UMPPs were envisioned, one of which is the Cheyyur Power Project (4000 MW) that is proposed to be located near Cheyyur, situated about 96 km south of Chennai, in Kancheepuram district of Tamil Nadu. As part of this project, a port is to be built at Panayur, about 5 km to the east of the power project site.

The environmental clearances – one each for the power plant and captive port – granted by the Union Ministry of Environment and Forests are being challenged by the local fishing community and environmentalists in the National Green Tribunal (Southern Bench). Also, there has been criticism of the environmental assessment report by conservationists. The National Green Tribunal, on a petition filed by locals, has restrained the project proponent from finalising the bids on grounds that it would not be prudent to award the bids and bring in a third party private player when

the fate of the environmental clearances itself is undecided. Petitioners to the NGT have argued that several facts and information in the project reports do not match the ground reality, including the site selection process, land requirement for the project, type of land appropriated, estimate of ecological resources in the area, and livelihood loss for the local community. Additionally, Community Environmental Monitoring (CEM), an NGO, brought out a Report titled “Science, Non-Science and the Dubious Role of ‘Experts’ in Environmental Due Diligence: A Case Study of Cheyyur UMPP” documenting at least several false statements made to facilitate environmental clearance.

With regard to ecological resources of the area, the Expert Appraisal Committee (EAC) in its 74th meeting minutes had stated that “migratory birds are found to be negligible in this lagoon.” Further, the project proponent’s EIA for the Captive Marine Terminal states in Table 4.1 (Evaluation of environmental siting according to MoEF criteria) that, within 10 km of the project site:

1. there is no Reserve Forest;
2. there are no mangroves or seagrass beds;
3. there are no significant areas of breeding or spawning grounds (for fish, crabs and prawns) in the vicinity;

- there are no areas that form a part of migratory route or nesting grounds for aquatic or avi-fauna;

[Source: Final Report on Comprehensive Environmental Impact Assessment of proposed Captive Marine Terminal off Panaiyur Chinnakuppam for Cheyyur UMPP. Prepared by National Institute of Ocean Technology for Coastal Tamil Nadu Power Ltd., Pages 39-40]

This is obviously wrong. The Palaiyur Reserve Forests are part of the lands being acquired for the power plant and fall within 10 km of the port site. There are documented mangroves and seagrass beds both in the Odiyur/Cheyyur lagoon and in the Yedanyanthittu estuary and backwaters to the south. A report by the Centre of Advanced Study (CAS) in Marine Biology, Annamalai University, Parangipettai, describes the Cheyyur/Odiyur lagoon as a significant “breeding and nursery

ground for shrimps, crabs and fishes.”

[Source: Report of CAS in Marine Biology, Annamalai University, Parangipettai, submitted by the project proponent to Ministry of Environment & Forests, February 2013]

Finally, the Odiyur/Cheyyur lagoon is well-known for its birdlife, including migratory species, by ornithologists and birdwatchers. To further substantiate this known fact, the Madras Naturalists Society (MNS) and the Bombay Natural History Society (BNHS) carried out a rapid survey of the wetland and its waterbirds on 25.11.2013. In this report, we discuss the data and observations obtained during the survey and cite published and unpublished literature available on the birds of the area.



ODIYUR LAGOON

The Odiyur/Cheyyur Lagoon (12°02'-12°19' N; 80°03'- 80°03' E) is located in Cheyyur Taluk of Kancheepuram district, Tamil Nadu, on the southeast coast of India. The lake is about 10 km long and 5 km wide; it is shallow with an average depth of 50 cm. The lake has a number of small freshwater canals flowing into it from the irrigation tanks, agricultural lands and catchment areas. It opens into the sea through a mouth, and another mouth is dredged for about 500 m to facilitate the drainage of flood waters during the monsoon. The salinity varies from 10 to 28 ppt, with lower salinity in the inland areas and higher near the mouth; there is a sharp fall in salinity during the monsoon. The seagrass *Halophila ovalis* is common and scattered throughout lagoon. Remnants of mangroves occur at some sites near to the coast. Besides crab and prawn species, 24 species of fish have been recorded from the lagoon.

[Source: Report of CAS in Marine Biology, Annamalai University, Parangipettai, submitted by the project proponent to Ministry of Environment & Forests, February 2013]

WATERBIRDS SIGHTED IN ODIYUR LAGOON DURING SURVEY ON 25.11.2013

A total of 17 species of waterbirds birds were recorded during the survey of the Odiyur-Cheyyur Lagoon (Table 1). Only a few species were recorded since the survey was only of a day and also since the water level was high. Most waterbird species, except those that swim/dive and feed, tend to forage in shallow water and will only be able to use the margin of wetland when water levels are high. Hence, more species and higher abundances of bird can be expected if water levels are low when the lagoon dries up (see Tables 2 and 3).

Table 1. Waterbirds recorded during the BNHS/MNS field trip to Odiyur Lagoon on 25.11.2013

COMMON NAME	SCIENTIFIC NAME
1. Little Cormorant	<i>Phalacrocorax niger</i>
2. Little Egret	<i>Egretta garzetta</i>
3. Grey Heron	<i>Ardea cinerea</i>
4. Large Egret	<i>Egretta alba</i>
5. Indian Pond-Heron	<i>Ardeola grayii</i>
6. Asian Openbill-Stork	<i>Anastomus oscitans</i>
7. Glossy Ibis	<i>Plegadis falcinellus</i>
8. Eurasian Wigeon	<i>Anas Penelope</i>
9. Red-wattled Lapwing	<i>Vanellus indicus</i>
10. Unidentified Snipes	<i>Gallinago sp.</i>
11. Common Greenshank	<i>Tringa nebularia</i>
12. Common Sandpiper	<i>Actitis hypoleucos</i>
13. Common Sandpiper	<i>Actitis hypoleucos</i>

COMMON NAME	SCIENTIFIC NAME
14. Brown-headed Gull	<i>Larus brunnicephalus</i>
15. Caspian Tern	<i>Sterna caspia</i>
16. Whiskered Tern	<i>Chlidonias hybridus</i>
17. Lesser Pied Kingfisher	<i>Ceryle rudis</i>

WATERBIRDS REPORTED IN THE ODIYUR LAGOON BY OTHER WORKERS

There are two checklists available of the waterbirds of the Odiyur lagoon. One is by Vikas Madhav (Madras Naturalists Society) who recorded 64 species during 2 birding trips on 15.12.2012 and 02.02.2013 (Table 2). The other, done by Dilip Patel

and other birders from Pondicherry, is based on counts of waterbirds from 2004-2012 obtained during the yearly Asian Waterfowl Census carried out simultaneously throughout India in winter every year (Table 3).

Table 2. Waterbirds recorded in the Odiyur Lagoon by Vikas Madhav (MNS) on 15.12.2012 and 02.02.2013

COMMON NAME	SCIENTIFIC NAME
1. Little Grebe	<i>Tachybaptus ruficollis</i>
2. Spot-billed Pelican	<i>Pelecanus philippensis</i>
3. Little Cormorant	<i>Phalacrocorax niger</i>
4. Indian Shag	<i>Phalacrocorax fuscicollis</i>
5. Little Egret	<i>Egretta garzetta</i>
6. Western Reef-Egret	<i>Egretta gularis</i>
7. Grey Heron	<i>Ardea cinerea</i>
8. Large Egret	<i>Egretta alba</i>
9. Median Egret	
10. Eastern Cattle-Egret	<i>Bubulcus ibis</i>
11. Indian Pond-Heron	<i>Ardeola grayii</i>
12. Striated Heron	<i>Butorides striatus</i>
13. Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
14. Black Bittern	<i>Dupetor flavicollis</i>
15. Painted Stork	<i>Mycteria leucocephala</i>

COMMON NAME	SCIENTIFIC NAME
16. Asian Openbill-Stork	<i>Anastomus oscitans</i>
17. Glossy Ibis	<i>Plegadis falcinellus</i>
18. Oriental White Ibis	<i>Threskiornis melanocephalus</i>
19. Eurasian Spoonbill	<i>Platalea leucorodia</i>
20. Greater Flamingo	<i>Phoenicopterus roseus</i>
21. Eurasian Wigeon	<i>Anas penelope</i>
22. Spot-billed Duck	<i>Anas poecilorhyncha</i>
23. Northern Shoveller	<i>Anas clypeata</i>
24. Northern Pintail	<i>Anas acuta</i>
25. Common Pochard	<i>Aythya ferina</i>
26. Brahminy Kite	<i>Haliastur indus</i>
27. White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>
28. Western Marsh-Harrier	<i>Circus aeruginosus</i>
29. Osprey	<i>Pandion haliaetus</i>
30. Greater Painted-Snipe	<i>Rostratula benghalensis</i>
31. Common Ringed Plover	<i>Charadrius hiaticula</i>
32. Little Ringed Plover	<i>Charadrius dubius</i>
33. Kentish Plover	<i>Charadrius alexandrinus</i>
34. Lesser Sand Plover	<i>Charadrius mongolus</i>
35. Greater Sand Plover	<i>Charadrius leschenaultii</i>
36. Greater Stone-Plover	<i>Esacus recurvirostris</i>
37. Red-wattled Lapwing	<i>Vanellus indicus</i>
38. Whimbrel	<i>Numenius phaeopus</i>
39. Eurasian Curlew	<i>Numenius arquata</i>
40. Black-winged Stilt	<i>Himantopus himantopus</i>
41. Common Redshank	<i>Tringa totanus</i>
42. Marsh Sandpiper	<i>Tringa stagnatilis</i>
43. Common Greenshank	<i>Tringa nebularia</i>
44. Green Sandpiper	<i>Tringa ochropus</i>

COMMON NAME	SCIENTIFIC NAME
45. Wood Sandpiper	<i>Tringa glareola</i>
46. Terek Sandpiper	<i>Xenus cinereus</i>
47. Common Sandpiper	<i>Actitis hypoleucos</i>
48. Little Stint	<i>Calidris minuta</i>
49. Temminck's Stint	<i>Calidris temminckii</i>
50. Curlew Sandpiper	<i>Calidris ferruginea</i>
51. Indian Skimmer	<i>Rhynchops albicollis</i>
52. Pallas's Gull	<i>Larus ichthyaetus</i>
53. Brown-headed Gull	<i>Larus brunnicephalus</i>
54. Slender-billed Gull	<i>Larus genei</i>
55. Lesser Crested Tern	<i>Thalasseus bengalensi</i>
56. Greater Crested Tern	<i>Thalasseus bergi</i>
57. Gull-billed Tern	<i>Gelochelidon nilotica</i>
58. Caspian Tern	<i>Sterna caspia</i>
59. Common Tern	<i>Sterna hirundo</i>
60. Little Tern	<i>Sterna albifrons</i>
61. Whiskered Tern	<i>Chlidonias hybridus</i>
62. Small Blue Kingfisher	<i>Alcedo atthis</i>
63. White-breasted Kingfisher	<i>Halcyon smyrnensis</i>
64. Lesser Pied Kingfisher	<i>Ceryle rudis</i>



Greater Flamingo (*Phoenicopterus roseus*)

Table 3. Asian Waterfowl Counts of the Odiyur Lagoon (2004-2012)
undertaken by Dilip Patel and Team from Pondicherry

COMMON NAME	SCIENTIFIC NAME	MAXIMUM RECORDED BETWEEN 2004-2012
1. Little Grebe	<i>Tachybaptus ruficollis</i>	11
2. Spot-billed Pelican	<i>Pelecanus philippensis</i>	473
3. Oriental Darter	<i>Anhinga melanogaster</i>	13
4. Little Cormorant	<i>Phalacrocorax niger</i>	26
5. Indian Shag	<i>Phalacrocorax fuscicollis</i>	536
6. Unidentified Cormorants	-	111
7. Little Egret	<i>Egretta garzetta</i>	377
8. Western Reef-Egret	<i>Egretta gularis</i>	1
9. Grey Heron	<i>Ardea cinerea</i>	56
10. Large Egret	<i>Egretta alba</i>	186
11. Median Egret	<i>Egretta intermedia</i>	693
12. Eastern Cattle-Egret	<i>Bubulcus ibis</i>	76
13. Unidentified Egrets	-	861
14. Indian Pond-Heron	<i>Ardeola grayii</i>	244
15. Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	1
16. Painted Stork	<i>Mycteria leucocephala</i>	150
17. Asian Openbill-Stork	<i>Anastomus oscitans</i>	110
18. Glossy Ibis	<i>Plegadis falcinellus</i>	150
19. Oriental White Ibis	<i>Threskiornis melanocephalus</i>	2028
20. Eurasian Spoonbill	<i>Platalea leucorodia</i>	347
21. Greater Flamingo	<i>Phoenicopterus roseus</i>	80
22. Lesser Flamingo	<i>Phoenicopterus minor</i>	160
23. Unidentified Flamingos	-	352
24. Bar-headed Goose	<i>Anser indicus</i>	18
25. Cotton Teal	<i>Nettapus coromandelianus</i>	126
26. Ruddy Shelduck	<i>Tadorna ferruginea</i>	6
27. Eurasian Wigeon	<i>Anas penelope</i>	3960

COMMON NAME	SCIENTIFIC NAME	MAXIMUM RECORDED BETWEEN 2004-2012
28. Spot-billed Duck	<i>Anas poecilorhyncha</i>	10
29. Northern Shoveller	<i>Anas clypeata</i>	311
30. Northern Pintail	<i>Anas acuta</i>	9000
31. Common Pochard	<i>Aythya ferina</i>	2500
32. Garganey	<i>Anas querquedula</i>	198
33. Unidentified Ducks	-	15150
34. Brahminy Kite	<i>Haliastur indus</i>	2
35. Western Marsh-Harrier	<i>Circus aeruginosus</i>	2
36. Osprey	<i>Pandion haliaetus</i>	1
37. White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	5
38. Purple Swamphen	<i>Porphyrio porphyrio</i>	1
39. Common Moorhen	<i>Gallinula chloropus</i>	4
40. Eurasian Coot	<i>Fulicra atra</i>	91
41. Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	14
42. Greater Painted-Snipe	<i>Rostratula benghalensis</i>	4
43. Common Snipe	<i>Gallinago gallinago</i>	348
44. Unidentified Snipes	-	10
45. Common Ringed Plover	<i>Charadrius hiaticula</i>	11
46. Little Ringed Plover	<i>Charadrius dubius</i>	89
47. Kentish Plover	<i>Charadrius alexandrinus</i>	171
48. Grey Plover	<i>Pluvialis squatarola</i>	45
49. Pacific Golden Plover	<i>Pluvialis fulva</i>	56
50. Red-wattled Lapwing	<i>Vanellus indicus</i>	28
51. Whimbrel	<i>Numenius phaeopus</i>	6
52. Eurasian Curlew	<i>Numenius arquata</i>	120
53. Blacktailed Godwit	<i>Limosa limosa</i>	87
54. Black-winged Stilt	<i>Himantopus himantopus</i>	1504
55. Greater Stone-Plover	<i>Esacus recurvirostris</i>	1
56. Common Redshank	<i>Tringa etanus</i>	105

COMMON NAME	SCIENTIFIC NAME	MAXIMUM RECORDED BETWEEN 2004-2012
57. Marsh Sandpiper	<i>Tringa stagnatilis</i>	27
58. Common Greenshank	<i>Tringa nebularia</i>	7
59. Wood Sandpiper	<i>Tringa glareola</i>	108
60. Common Sandpiper	<i>Actitis hypoleucos</i>	82
61. Little Stint	<i>Calidris minuta</i>	112
62. Red-necked Phalarope	<i>Phalaropus lobatus</i>	5
63. Unidentified plovers and sandpipers	-	5323
64. Pallas's Gull	<i>Larus ichthyaetus</i>	1
65. Brown-headed Gull	<i>Larus brunnicephalus</i>	119
66. Black-headed Gull	<i>Larus ridibundus</i>	49
67. Unidentified Gulls	-	40
68. Gull-billed Tern	<i>Gelochelidon nilotica</i>	68
69. Caspian Tern	<i>Sterna caspia</i>	12
70. Common Tern	<i>Sterna hirundo</i>	13
71. Bridled Tern	<i>Sterna anaethetus</i>	11
72. Little Tern	<i>Sterna albifrons</i>	45
73. Whiskered Tern	<i>Chlidonias hybridus</i>	127
74. Unidentified Terns	-	1088
75. Small Blue Kingfisher	<i>Alcedo atthis</i>	7
76. White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	19
77. Lesser Pied Kingfisher	<i>Ceryle rudis</i>	7

Clubbing the three checklists (Tables 1-3), the Odiyur wetland is known to support around 77 waterbirds species (excluding wagtails and pratincole species that use the margins of the wetland). These include resident and seasonal mi-

grants (which breed elsewhere in the region), and winter migrants (species that breed in the Palearctic/Himalayas region and spend the winter in the Indian region).

IMPORTANCE OF THE ODIYUR LAGOON FOR WATERBIRDS

From the three checklists of birds of Odiyur Lagoon given above, and especially considering the counts of the Asian Waterfowl Census, it is very evident that the statement of the EAC that “migratory birds are found to be negligible in this lagoon” is incorrect. The wetland supports substantial populations of bird species number-

ing not less than 77 species. Among these, there are eight species which are on the threatened list of 42 bird species of India as per Birdlife International/IUCN’s (2011). More new records and interesting findings could result if an intensive study covering all the seasons is undertaken.

Table 4. Threatened bird species recorded in Odiyur Lagoon

COMMON NAME	IUCN CATEGORY	NUMBER RECORDED
1. Spot-billed Pelican	Vulnerable	473
2. Oriental Darter	Near Threatened	13
3. Painted Stork	Near Threatened	150
4. Oriental White Ibis	Near Threatened	2028
5. Lesser Flamingo	Near Threatened	160 +
6. Eurasian Curlew	Near Threatened	120
7. Black-tailed Godwit	Near Threatened	87
8. Indian Skimmer	Vulnerable	1

Considering the occurrence of eight “Threatened” bird species in the wetland and the large congregations of some of the waterfowl species, the Odiyur lagoon warrants to be recognised as an “Important Bird Area” of India. The Odiyur wetland is in the vicinity of two other important wetlands for waterbirds in India, the Kaliveli Tank-Yedayanthittu Estuary and Vedanthangal Bird Sanctuary, both of which have been identified as

Important Bird Areas (IBA) of India by BirdLife International and Bombay Natural History Society. All these three wetlands should be given strict protection and be free of disturbances to serve as long-term conservation sites of the resident, seasonal migrant and winter migrant waterbirds of this region.



Spot-billed Pelican (*Pelecanus philippensis*) | Great Egret (*Egretta alba*) - 3 individuals in the photograph

PROBABLE THREATS TO ODIYUR LAGOON AND ITS WATERBIRD POPULATIONS FROM THE PROPOSED 4000MW POWER PLANT

The Odiyur Lagoon with the Yedayanthittu Estuary to its south are two major estuaries of the area that receive inflow from several freshwater sources and flow into the Bay of Bengal. They support a multitude of flora and fauna, besides playing an important role in regulating floodwater flows and maintaining the fisheries potential of the region. Other than the lagoon, the surrounding area consists of beaches, mudflats, dunes with typical coastal vegetation. For these reasons alone, such areas should be strictly treated as a 'no development' zones, especially for industries that have the potential, either in the short or long term, to adversely impact the well-being of this important ecosystem.

Though the proposed Cheyyur Thermal Power Plant will not draw from or release water into the Odiyur Lagoon (this will be sourced from the sea and wastewater discharged back into the sea), the estuarine ecosystem, adjoining habitats, and its rich waterbird populations and other fauna would face direct and indirect threats from the plant and the captive port. These threats would be through air pollution in the form of acidic emissions and mercury as vapour (which would also get deposited into the wetlands with time) and contaminated runoff from the ash pond and power plant site into the lagoon during floods. Further, the location of the plant, and the alignments of the conveyor belt and storm-water drain will alter the drainage pattern in the area causing irreversible damage to the delicate mangroves and estuarine ecosystems.

A long-term threat would be the inevitable 'development' of the area after the plant comes up, by way of increase in infrastructure, road network, traffic, and changes in the profile of this rural landscape now comprising largely of crop fields, grazing lands, scrub forest and wetlands to a more urban setup. All these developments will result in increasing pressures on the Odiyur Lagoon with the passing years (as has been the case with the Muttukadu Lagoon to its north), thereby affecting this important refuge for waterfowl, even while harming the fisheries economy of the area. Moreover, the siting guidelines for power plants prescribed by the Ministry of Environment & For-

ests suggest a minimum setback of 25 km from "ecologically sensitive areas like tropical forest, biosphere reserve, important lake and coastal areas rich in coral formation."

[Source: Technical EIA Guidance Manual for Thermal Power Plants. Ministry of Environment & Forests. August 2010, Pages 4-9].

Considering all the above discussed issues, the BNHS and MNS are of the opinion that the proposal by the Government of India to establish the coal-fired power plant in Cheyyur needs serious rethinking. The plant and the captive port, if allowed, will in the long run adversely impact the ecological health of Odiyur Lagoon. As stated earlier, the lagoon supports substantial populations of resident and migratory waterbirds, and is an important ecosystem that governs the fisheries potential of the region as a whole. Additionally, the lagoon and its catchment are vital to the drainage in the area and important as a mitigator during extreme weather events like heavy rainfall or cyclonic storms.

RECOMMENDATIONS

1. Relocate the power plant and captive port to an alternative location that is in compliance with the siting guidelines prescribed by the Ministry of Environment & Forests.
2. Notify the Cheyyur lagoon and its catchment as an ecologically important area and regulate activities to ensure protection of local biodiversity, local livelihoods and the region's water storage potential.



Eurasian Curlew (*Numenius arquata*)

ABOUT THE AUTHORS

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BOMBAY NATURAL HISTORY SOCIETY is one of the major non-governmental research and conservation institutes on wildlife studies, nature conservation and education in India. The Society has undertaken research projects with funding or in association with the Ministry of Environment & Forests, Government of India, the U.S. Fish and Wildlife Service, Birdlife International, Royal Society for Protection of Birds and the Smithsonian Institution, among others.

The **MADRAS NATURALISTS’ SOCIETY** is a non-profit, voluntary, non-governmental organisation established in 1978 in Chennai to create environmental awareness and spread the message of nature conservation among members and the general public, especially the youth.

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Spot-billed Pelican (*Pelecanus philippensis*)