

3.11. PICHAVARAM MANGROVE FOREST

❖ **State / Union Territory:** Tamil Nadu

❖ **Name and address of person (s) compiling this information:**

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Section 1: Identification, Location and Jurisdiction

- 1.1 *Name of the Wetland:* Pichavaram Mangrove Forest or Killai Back waters or Pichavaram Vayal
- 1.2 *Name of the Village (s), Tehsil (s), Municipal area (s):* Killai, Kille, Pichavaram, Kanakkarapattu, Thirukazhipalai, Kodyampalayam, Singarakuppam
- 1.3 *Name of the District (s) in which Wetlands complex located:* Cuddalore
- 1.4 *Geographical coordinates:*
 - ▶ Latitude: 11°26'17" N
 - ▶ Longitude: 79°47'11" E
- 1.5 *Name of the Department/ Agency which has jurisdiction over Wetland/ Wetland complex:* Forest Department

Section 11: Site Characteristics

- 2.1 *Area of Wetland:* 1478.48 ha
- 2.2 *Wetland type:*

Category	Subcategory
<input type="checkbox"/> Natural (Inland)	<input type="checkbox"/> Permanent lakes <input type="checkbox"/> Seasonal/ intermittent lakes <input type="checkbox"/> Permanent streams/ creeks <input type="checkbox"/> Seasonal/ intermittent streams/ creeks <input type="checkbox"/> Oxbow <input type="checkbox"/> River floodplain <input type="checkbox"/> Permanent freshwater marshes <input type="checkbox"/> Seasonal/ intermittent freshwater marshes <input type="checkbox"/> Shrub-dominated Wetlands <input type="checkbox"/> Tree-dominated Wetlands <input type="checkbox"/> Geothermal Wetlands

	<input type="checkbox"/> Karst and other subterranean hydrological systems
<input checked="" type="checkbox"/> Natural (Coastal)	<input type="checkbox"/> Coastal lagoon <input checked="" type="checkbox"/> Estuary <input type="checkbox"/> Intertidal mud, sand or salt flats <input checked="" type="checkbox"/> Mangroves <input type="checkbox"/> Coral reef
<input type="checkbox"/> Human-made	<input type="checkbox"/> Aquaculture pond <input type="checkbox"/> Tank <input type="checkbox"/> Saltpan <input type="checkbox"/> Dam/ Reservoir

2.3 *Depth (m):* Average - 2.5; Maximum – 5

2.4 *Elevation (m above mean sea level):* 1

2.4 *Water regimes*

a) Main source of water

- Rainfall inflow from river
- Groundwater
- Catchment runoff
- Direct/ indirect inflow from the river
- Others, please specify: Backwater received from Bay of Bengal
- Name of River/ Canal System: Vellar Estuary, Coleroon Estuary

b) Water performance

- Mostly permanent
- Mostly intermittent

c) Destination of water from Wetland

- Feeds groundwater river to sea
- To downstream catchment

d) Water pH

- Acid (< 5.5)
- Circumneutral (5.5-7.4)
- Alkaline (> 7.4)

e) Water salinity

- Fresh (< 0.5 g/l)
- Brackish (0.5-110 g/l)
- Euhaline (110-40 g/l)
- Hypersaline (> 40 g/l)
- Not known

- f) Nutrients in water
- Eutrophic
 - Mesotrophic
 - Oligotrophic
 - Not known

2.5 *Climatic setting*

- a) Annual rainfall/ Snowfall (mm): 218.1
 b) Temperature (°C) Minimum 26.1 ; Maximum 35.95
 c) Humidity (%) Minimum 65.8 ; Maximum 70.1

2.6 *Area of zone of influence (in ha):* 15576.85 ha (with an irregular radius of 5.67 km)

2.7 *Major land use within zone of influence*

Land Use	Percentage
Forest	: 0%
Vegetation (Plantation)	: 13%
Agriculture	: 34%
Settlements (Rural)	: 12%
Settlements (Urban)	: 0%
Industrial	: 0%
Waterbody	: 38%
Beach	: 1%
Aquaculture	: 2%

2.8 *Map of Wetland complex and zone of influence:* Enclosed as Annexure 3.11 (Fig. 3.11.1-3.11.2)

Section 3: Biodiversity

- 3.1 *Notable plant species present in Wetland:* The Wetland is home to a diverse range of plant species, totaling 54 species (refer to Table 3.11.1 in Annexure 3.11).
- 3.2 *Notable animal species present in Wetland:* The Wetland supports a variety of animal species, with a total of 188 recorded species. This includes 7 mammal species, 21 reptile species, 9 amphibian species, 138 bird species, and 13 species of butterflies (refer to Table 3.11.2-3.11.3 in Annexure 3.11).
- 3.3 *Species of conservation significance:* Highlighted in Table 3.11.1-3.11.3
- 3.4 *Major plant invasive alien species:* The Wetland supports 11 plant invasive species (refer to Table 3.11.4 in Annexure 3.11).
- 3.5 *Major animal invasive alien species:* The Wetland supports 2 animal invasive species (refer to Table 3.11.5 in Annexure 3.11).

Section 4: Ecosystem Services

Importance	Relevance	Details
Source of drinking water for people living and around	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Source of water for agriculture	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Fisheries	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Communal fishing is happening
Cultivation of aquatic food plants	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
For buffalo wallowing and use of domesticated animals	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Medicinal plants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Few Medicinal plants around the Wetland. Which is listed in Table 3.11.6 (Annexure 3.11)
Is a recreational site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buffering communities from extreme events as floods and storms	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Mangroves act as buffering agent from extreme events as floods and storms
Groundwater recharge	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Water purification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Acts as a sink for sediments	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Has significant cultural and religious values	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is a site for recreation and tourism	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Supports noteworthy plants species	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Support noteworthy animal species	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Site of high congregation of migratory water birds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Provides a suitable site for the high congregation of migratory water birds.

Supports life cycle of fish or amphibians	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Almost 9 variants of amphibians has been surviving
Mining	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Aquaculture	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Aquaculture plants were observed while ground-truthing
Mangroves	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Mangroves are essential for Carbon sequestration.

Section 5: Pre-Existing Rights and Privileges

Nature of right and privilege	Relevant for the site	Does this negatively impact the Wetland's ecological health?	Brief description
Community Fishing (without any lease or permission from government department)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not assessed	Communal fishing is happening
Fishing under lease from government department	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Harvest of plants (without any lease or permission from government department)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Harvest of plants under lease from government department	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Agriculture or horticulture within Wetland	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Grazing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Religious practices	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	

Withdrawal of water for domestic use	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Withdrawal of water for agriculture or fisheries	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Bathing or wallowing of domestic animals	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Plying of boats	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not assessed	Boating is there for fishing & Mainly for tourism
Aquaculture	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not assessed	Aquaculture were observed while ground-truthing

Section 6: Present and Potential Threats

Threat	Degree	Present/ Potential	Additional info.
Changes in water inflow and outflow	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	
Pollution	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	
Unsustainable harvest of biological resources	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	
Mining	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	
Siltation	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	
Encroachment	<input type="checkbox"/> High	<input type="checkbox"/> Present	

	<input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Potential	
Spread of invasive species	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Listed in Table 3.11.4 in Annexure 3.11
Disruption due to Ghost nuts	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Ghost nuts are observed more in number

Section 7: Activities Proposed to Be Prohibited (other than those listed in Rule 4 (11) of Wetlands Rules and Regulated

Activity	Whether prohibited or regulated	Regulation within Wetlands zone of influence	If regulated indicates the level of regulation	Name of department/ agency responsible for regulation/ prohibition	Additional info.
Withdrawal of water / impoundment/diversion or any other hydrological intervention		<input type="checkbox"/> Wetland/ Wetland complex boundary <input type="checkbox"/> Zone of influence			
Harvesting of resources (living / non-living)		<input type="checkbox"/> Wetland/ Wetland complex boundary <input type="checkbox"/> Zone of influence			
Grazing		<input type="checkbox"/> Wetland/ Wetland complex boundary <input type="checkbox"/> Zone of influence			
Discharge of treated sewage/ effluent / wastewater		<input type="checkbox"/> Wetland/ Wetland complex			

		boundary <input type="checkbox"/> Zone of influence			
Construction of boat jetties, and facilities for temporary use, as pantoon bridges	Prohibited	<input type="checkbox"/> Wetland/ Wetland complex boundary <input checked="" type="checkbox"/> Zone of influence			There is a boat jetty for each access & anchorage of boats
Aquaculture, agriculture and horticulture activities within the Wetland boundaries.	Regulated	<input type="checkbox"/> Wetland/ Wetland complex boundary <input checked="" type="checkbox"/> Zone of influence			
Any others		<input type="checkbox"/> Wetland/ Wetland complex boundary <input type="checkbox"/> Zone of influence			

Section 8: Activities Proposed to be permitted

Activity	Relevance	Within Wetlands or zone of influence	Additional info.
		<input type="checkbox"/> Wetland/ Wetlands complex boundary <input type="checkbox"/> Zone of influence	

Section 9: Listing of Available Scientific Resources Used

1. Abhisheka, K., David, J.P., Prashanth, M.B., Seshadri, K.S., & Ganesh, T. (2013). First detailed survey of waterbirds in Tirunelveli and Tuticorin districts, Tamil Nadu, India. Journal of Threatened Taxa, 5(111), 4641–4651. <https://doi.org/10.11609/JoTT.o31115.4641-511>
2. Aengals, R., Sathish Kumar, V.M., Palot, M.J., & Ganesh, S.R. (2018). A checklist of reptiles of India (Version 3.0). 35 pp. Available online at www.zsi.gov.in (Last update: May 2018).

3. Ali, S. (2011). *The book of Indian birds (13th Revised Edition)*. Oxford University Press, New Delhi.
4. Bibby, C.J., Burgess, N.D., & Hill, D.A. (1993). *Bird census techniques*. Academic Press Limited, London.
5. Gamble, J.S., & Fischer, C.E.C. (1915-1935). *Flora of Presidency of Madras*. Adlard and Son, London.
6. Grimmet, R., Inskipp, C., & Inskipp, T. (2000). *Pocket guide to the birds of the Indian subcontinent*. Oxford University Press, New York.
7. Henry, A.N., Chithra, V.N., & Balakrishnan, P. (1989). *Flora of Tamil Nadu India. Series 1: Analysis, Vol. III*. Botanical Survey of India, Coimbatore.
8. Ratnam, K. *Birds of Tamil Nadu*.
9. Kamalakannan, M., & Nameer, P.O. (2019). A checklist of mammals of Tamil Nadu, India. *Journal of Threatened Taxa*, 11(8), 13991–14009. <https://doi.org/10.11609/jott.4705.11.8.13991-14009>.
10. Kehimkar, I. (2008). *The book of Indian butterflies*. Bombay Natural History Society.
11. Matthew, K. M. (1981). *The material for the flora of the Tamil Nadu Carnatic*. Madras, India.
12. Matthew, K. M. (1981). *Illustrations on the flora of the Tamil Nadu Carnatic (Vol. II)*. The Diocesan Press, Madras, India.
13. Matthew, K. M. (1983). *The flora of Tamil Nadu Carnatic (Vol. III)*. The Diocesan Press, Madras, India.
14. Matthew, K. M. (1988). *Further illustrations on the flora of the Tamil Nadu Carnatic (Vol. IV)*. The Diocesan Press, Madras, India.
15. Nair, N.C., & Henry, A.N. (1983). *Flora of Tamil Nadu, India. Series 1, Vol. 1*. Botanical Survey of India, Southern Circle, Coimbatore.
16. Sudhakaran, M.R., & Sekar, R. (2011). Status of aquatic birds and flora of Vagaikulam, Tenkasi, Tamil Nadu. *Indian Journal of Fundamental and Applied Life Sciences*, 1, 5-11.

ANNEXURE 3.11

Fig 3.11.1. Zone of Influence of Pichavaram Mangrove Forest

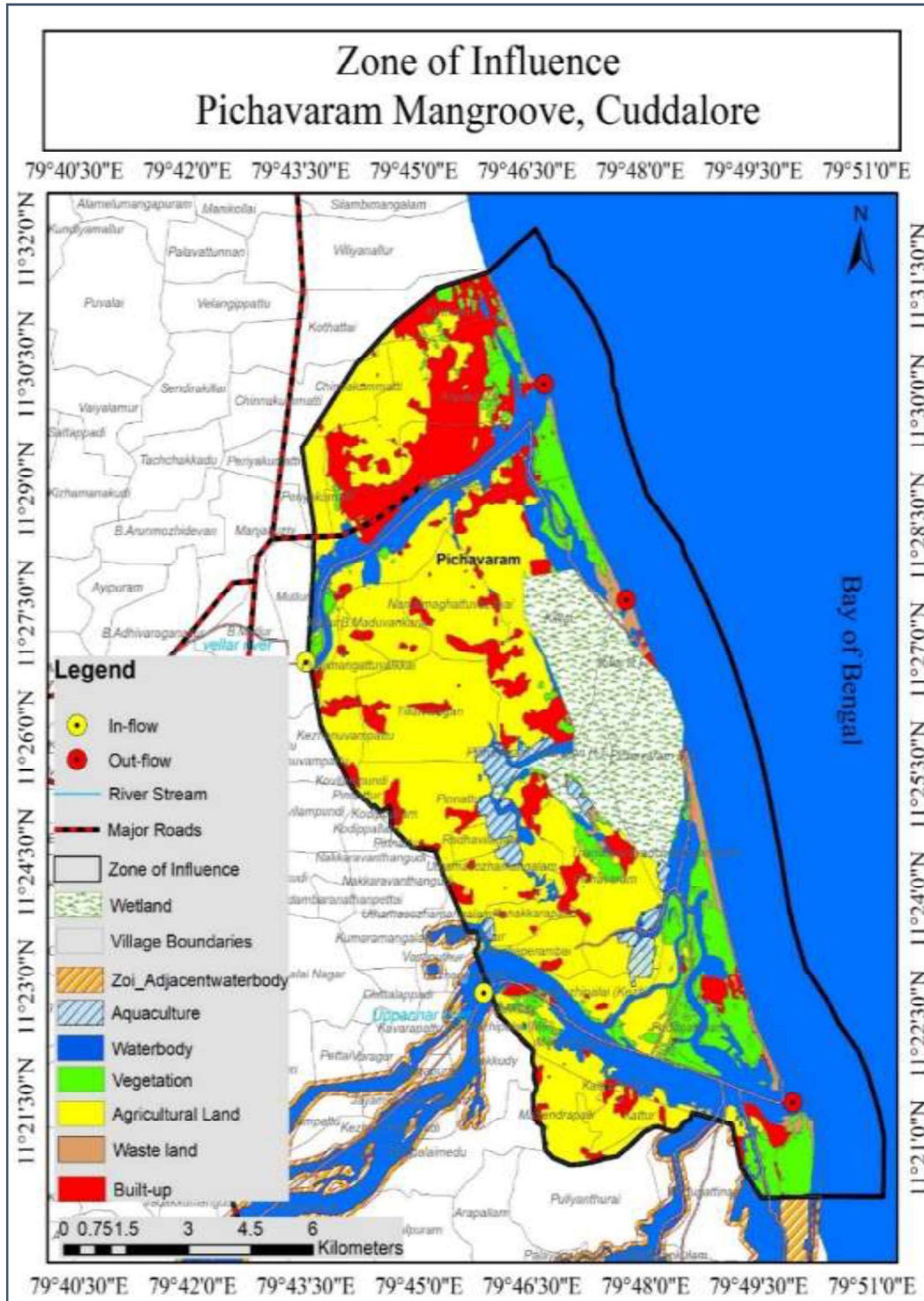


Fig 3.11.2. Map (2014 vs. 2024) and Land Use/ Land Cover of Pichavaram Mangrove Forest

Map of the Wetland in 2014



Map of the Wetland in 2024



Land Use/ Land Cover of the Wetland

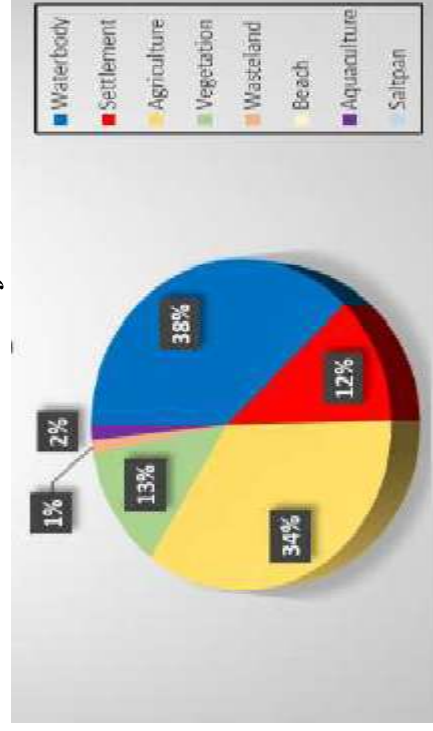


Table 3.11.1. IUCN Status of Floral Species in Pichavaram Mangrove Forest

S. No.	Scientific Name of the Species	Family	Tamil Name	Habit	IUCN
1.	<i>Abrus precatorius</i>	Fabaceae	Kundumani	Climber	NE
2.	<i>Abutilon indicum</i>	Malvaceae	Thuthi	Shrub	LC
3.	<i>Acalypha indica</i>	Euphorbiaceae	Kuppaimeni	Herb	NE
4.	<i>Acanthospermum hispidum</i>	Compositae		Herb	NE
5.	<i>Achyranthes aspera</i>	Amaranthaceae	Nayurivi	Herb	NE
6.	<i>Aerva lanata</i>	Amaranthaceae	Peelai, Sirupeelai	Herb	NE
7.	<i>Aeschynomene indica</i>	Fabaceae	Kothiram	Herb	NE
8.	<i>Avicennia marina</i>	Acanthaceae	Venkandan	Tree	LC
9.	<i>Argemone mexicana</i>	Papaveraceae	Nai Kadugu	Herb	NE
10.	<i>Boerhavia diffusa</i>	Nyctaginaceae	Mookarattai	Herb	NE
11.	<i>Brachiaria mutica</i>	Poaceae		Grass	NE
12.	<i>Calotropis gigantea</i>	Asclepiadaceae	Erukku, Arkkam	Shrub	NE
13.	<i>Cardiospermum halicacabum</i>	Sapindaceae	Mudakotthan	Herb	NE
14.	<i>Chloris barbata</i>	Poaceae	Kodaipul	Grass	NE
15.	<i>Cleome viscosa</i>	Capparidaceae	Nai vaelai	Herb	NE
16.	<i>Corchorus capsularis</i>	Tiliaceae	Sanal	Herb	NE
17.	<i>Cynodon dactylon</i>	Poaceae	Aruhampul	Grass	NE
18.	<i>Cyperus alternifolius</i>	Cyperaceae		Sedge	NE
19.	<i>Cyperus iria</i>	Cyperaceae		Sedge	NE
20.	<i>Datura metal</i>	Solanaceae	Karu Oomatthai	Herb	NE
21.	<i>Digitaria ciliaris</i>	Poaceae		Grass	NE
22.	<i>Eragrostis viscosa</i>	Poaceae	-	Grass	LC
23.	<i>Ipomoea carnea</i>	Convolvulaceae		Shrub	NE
24.	<i>Ipomoea pes-caprae</i>	Convolvulaceae	Attukkal	Climber	LC
25.	<i>Ischaemum indicum</i>	Poaceae	-	Grass	LC

26.	<i>Jatropha gossypifolia</i>	Euphorbiaceae	Kaatu-amanakku	Shrub	NE
27.	<i>Justicia prostrata</i>	Acanthaceae		Herb	NE
28.	<i>Launaea bellidifolia</i>	Asteraceae		Herb	LC
29.	<i>Lantana camara</i>	Verbenaceae	Unnichedi	Shrub	LC
30.	<i>Martynia annua</i>	Martyniaceae	Thael Kodukku	Herb	NE
31.	<i>Mollugo cerviana</i>	Molluginaceae	Parpaadagam	Herb	NE
32.	<i>Mukia leiosperma</i>	Cucurbitaceae		Climber	NE
33.	<i>Parthenium hysterophorus</i>	Compositae	Vishachedi	Herb	LC
34.	<i>Passiflora foetida</i>	Passifloraceae	Poonaipidukku	Climber	NE
35.	<i>Pedaliium murex</i>	Pedaliaceae		Herb	NE
36.	<i>Phyllanthus reticulatus</i>	Euphorbiaceae	Inki pazham	Shrub	LC
37.	<i>Prosopis julifera</i>	Fabaceae	Semai karuvel	Tree	LC
38.	<i>Salicornia brachiata</i>	Chenopodiaceae	Kattumari	Herb	LC
39.	<i>Senna occidentalis</i>	Caesalpiniaceae	Thagarai	Shrub	NE
40.	<i>Senna siamea</i>	Fabaceae		Tree	LC
41.	<i>Senna tora</i>	Caesalpiniaceae	Oosi thagarai	Herb	NE
42.	<i>Solanum trilobatum</i>	Solanaceae	Thoodhuvalai	Herb	NE
43.	<i>Spermacoce hispida</i>	Rubiaceae	Nathaichoori	Herb	NE
44.	<i>Sphaeranthus amaranthoides</i>	Compositae	Siva karandhai	Herb	LC
45.	<i>Rhizophora mucronata</i>	Rhizophoraceae		Tree	LC
46.	<i>Tephrosia purpurea</i>	Fabaceae	Kozhinji	Herb	NE
47.	<i>Thespesia populnea</i>	Malvaceae	Poovarasu	Tree	LC
48.	<i>Tinospora cordifolia</i>	Menispermaceae	Seendhil	Climber	NE
49.	<i>Trachys muricata</i>	Poaceae	-	Grass	LC
50.	<i>Trianthema portulacastrum</i>	Aizoaceae		Herb	NE
51.	<i>Tridax procumbens</i>	Compositae	Vettukkaaya poondu	Herb	LC
52.	<i>Tylophora indica</i>	Asclepiadaceae	Naippalai	Climber	NE

53.	<i>Typha angustifolia</i>	Typhaceae	Sambu	Herb	LC
54.	<i>Xanthium indicum</i>	Compositae	Marul oomatham	Herb	LC

Table 3.11.2. IUCN Status of Selected Fauna Species in Pichavaram Mangrove Forest

S. No.	Scientific Name of the Species	Family	Common Name	IUCN
<i>A. Mammal</i>				
1.	<i>Macaca radiata</i>	Cercopithecidae	Bonnet macaque	
2.	<i>Pipistrellus coromandra</i>	Vespertilionidae	Indian pipistrelle	LC
3.	<i>Funambulus palmarum</i>	Sciuridae	Three-striped palm squirrel	LC
4.	<i>Bandicota bengalensis</i>	Muridae	Bandicoot	LC
5.	<i>Rattus rattus</i>	Muridae	House rat	LC
6.	<i>Urva edwardsii</i>	Herpestidae	Indian grey mongoose	LC
7.	<i>Canis aureus</i>	Canidae	Jackal	LC
<i>B. Reptile</i>				
1.	<i>Calotes versicolor</i>	Agamidae	Garden lizard	LC
2.	<i>Sitana ponticeriana</i>	Agamidae	Fan-throated lizard	LC
3.	<i>Mabuya carinata</i>	Scincidae	Common skink	LC
4.	<i>Lygosoma punctata</i>	Scincidae	Garden skink	LC
5.	<i>Lygosoma albopunctata</i>	Scincidae	White-spotted garden skink	LC
6.	<i>Varanus bengalensis</i>	Varanidae	Indian monitor lizard	NT
7.	<i>Hemidactylus brookii</i>	Gekkonidae	Spotted gecko	LC
8.	<i>Hemidactylus triedrus</i>	Gekkonidae	Termite-hill gecko	LC
9.	<i>Hemidactylus frenatus</i>	Gekkonidae	House gecko	LC
10.	<i>Hemidactylus leschenaultia</i>	Gekkonidae	Bark gecko	LC
11.	<i>Ramphotyphlops braminus</i>	Typhlopidae	Blind snake	LC
12.	<i>Amphiesma stolata</i>	Colubridae	Striped keel back	NE

13.	<i>Atretium schistosum</i>	Colubridae	Olive keel back	LC
14.	<i>Xenochrophis piscator</i>	Colubridae	Checkered keel back	LC
15.	<i>Ptyas mucosus</i>	Colubridae	Rat snake	NE
16.	<i>Ahaetulla nasuta</i>	Colubridae	Green vine snake	LC
17.	<i>Naja naja</i>	Elapidae	Cobra	LC
18.	<i>Bungarus caeruleus</i>	Elapidae	Krait	LC
19.	<i>Vipera russelli</i>	Viperidae	Russell's viper	LC
20.	<i>Melanochelys trijuga</i>	Geoemydidae	Pond turtle	LC
21.	<i>Lissemys punctata</i>	Trionychidae	Falpsshell	VU
<i>C. Amphibian</i>				
5.	<i>Euphlyctis hexadactylus</i>	Agamidae	Indian pond frog	LC
6.	<i>Euphlyctis cynophlyctis</i>	Colubridae	Skipper	LC
7.	<i>Tomopterna rolandae</i>	Agamidae	Burrowing frog	LC
8.	<i>Hoplobatrachus crassus</i>	Colubridae	Jerdon's bull frog	LC
9.	<i>Limnonectes limnocharis</i>	Lacertidae	Paddy Field frog	LC
10.	<i>Kaloula taprobanica</i>	Agamidae	Painted frog	LC
11.	<i>Ramanella variegata</i>	Elapidae	Marbled frog	LC
12.	<i>Bufo melanostictus</i>	Bufonidae	Indian Toad	LC
13.	<i>Polypedates maculatus</i>	Rhacophoridae	Common tree frog	LC
<i>D. Butterfly</i>				
1.	<i>Euploea core</i>	Nymphalidae	Common crow	LC
2.	<i>Catopsilia pomona</i>	Pieridae	Common Emigrant	NE
3.	<i>Melanitis leda</i>	Nymphalidae	Common evening brown	LC
4.	<i>Eurema hecabe</i>	Pieridae	Common grass yellow	LC
5.	<i>Papilio demoleus</i>	Papilionidae	Common lime	NE
6.	<i>Papilio polytes</i>	Papilionidae	Common mormon	NE
7.	<i>Junonia lemonias</i>	Nymphalidae	Lemon pansy	NE

8.	<i>Catopsilia pyranthe</i>	Pieridae	Mottled Emigrant	NE
9.	<i>Pseudozizeeria maha</i>	Lycaenidae	Pale Grass Blue	NE
10.	<i>Junonia almana</i>	Nymphalidae	Peacock pansy	LC
11.	<i>Danaus chrysippus</i>	Nymphalidae	Plain tiger	LC
12.	<i>Acraea violae</i>	Nymphalidae	Tawny coster	LC
13.	<i>Pachliopta aristolochiae</i>	Papilionidae	Common Rose	NE

LC – Least Concern; * - Yes

Table 3.11.3. IUCN Status of Bird Species in Pichavaram Mangrove Forest

S. No.	Scientific Name of the Species	Common name	Habitat	IUCN	Status
1.	<i>Accipiter badius</i>	Shikra	T	LC	*
2.	<i>Acridotheres tristis</i>	Common Myna	T	LC	*
3.	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	T	LC	*
4.	<i>Actitis hypoleucos</i>	Common Sandpiper	A	LC	*
5.	<i>Aegithina tiphia</i>	Common Iora	T	LC	*
6.	<i>Alauda gulgula</i>	Oriental Skylark	T	LC	
7.	<i>Alcedo atthis</i>	Common Kingfisher	T	LC	*
8.	<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	A	LC	
9.	<i>Anas acuta</i>	Northern Pintail	A	LC	
10.	<i>Anas clypeata</i>	Northern Shoveller	A	LC	
11.	<i>Anas crecca</i>	Common Teal	A	LC	*
12.	<i>Anas penelope</i>	Eurasian Wigeon	A	LC	
13.	<i>Anas poecilorhyncha</i>	Spot-billed Duck	A	LC	
14.	<i>Anas querquedula</i>	Garganey	A	LC	
15.	<i>Anastomus oscitans</i>	Asian Openbill	A	LC	*
16.	<i>Anhinga melanogaster</i>	Darter	A	LC	
17.	<i>Anthus richardi</i>	Richard's Pipit	D	LC	
18.	<i>Anthus rufulus</i>	Paddy-field Pipit	D	LC	*
19.	<i>Apus affinis</i>	House Swift	T	LC	
20.	<i>Ardea cinerea</i>	Grey Heron	A	LC	*

21.	<i>Ardea purpurea</i>	Purple Heron	A	LC	
22.	<i>Ardeola grayii</i>	Indian Pond Heron	A	LC	*
23.	<i>Artamus fuscus</i>	Ashy Woodswallow	T	LC	
24.	<i>Athene brama</i>	Spotted Owlet	T	LC	
25.	<i>Bubulcus ibis</i>	Cattle Egret	D	LC	*
26.	<i>Burhinus oedicephalus</i>	Eurasian Thick-knee	A	LC	
27.	<i>Burhinus recurvirostris</i>	Great Thick-knee	A	LC	
28.	<i>Burhinus oedicephalus</i>	Stone Curlew	A	LC	
29.	<i>Butas turteesa</i>	White-eyed Buzzard	T	LC	
30.	<i>Buteo buteo</i>	Common Buzzard	T	LC	
31.	<i>Butorides striatus</i>	Little Green Heron	A	LC	
32.	<i>Cacomantis passerinus</i>	Indian Plaintive Cuckoo	T	LC	
33.	<i>Calidris ferruginea</i>	Curlew sandpiper	A	LC	
34.	<i>Calidris pugnax</i>	Ruf	A	LC	
35.	<i>Calidris minuta</i>	Little Stint	A	LC	*
36.	<i>Calidris temminckii</i>	Temminck's stint	A	LC	
37.	<i>Caprimulgus indicus</i>	Indian Jungle Nightjar	T	LC	
38.	<i>Casmerodius albus</i>	Great Egret	A	LC	
39.	<i>Centropus sinensis</i>	Greater Coucal	T	LC	
40.	<i>Ceryle rudis</i>	Pied Kingfisher	D	LC	*
41.	<i>Charadrius alexandrinus</i>	Kentish Plover	A	LC	
42.	<i>Charadrius dubius</i>	Little Ringed Plover	A	LC	
43.	<i>Chlidonias hybridus</i>	Whiskered Tern	A	LC	
44.	<i>Chlidonias leucopterus</i>	White-winged Tern	A	LC	
45.	<i>Chroicocephalus brunnicephalus</i>	Brown-headed Gull	A	LC	
46.	<i>Chroicocephalus ridibundus</i>	Black-headed gull	A	LC	
47.	<i>Ciconia episcopus</i>	Woolly-necked Stork	A	LC	
48.	<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	D	LC	
49.	<i>Circus macrourus</i>	Pallid Harrier	T	LC	
50.	<i>Circus melanoleucos</i>	Pied Harrier	T	LC	

51.	<i>Cisticola juncidis</i>	Zitting Cisticola	T	LC	
52.	<i>Clamator jacobinus</i>	Pied Cuckoo	T	LC	
53.	<i>Columba livia</i>	Rock Pigeon	T	LC	
54.	<i>Copsychus saularis</i>	Oriental Magpie Robin	T	LC	
55.	<i>Coracias benghalensis</i>	Indian Roller	T	LC	*
56.	<i>Corvus macrorhynchos</i>	Large-billed Crow	T	LC	*
57.	<i>Corvus splendens</i>	House Crow	T	LC	*
58.	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	T	LC	*
59.	<i>Dendrocitta vagabunda</i>	Rufous Treepie	T	LC	*
60.	<i>Dicrurus adsimilis</i>	Black Drongo	T	LC	*
61.	<i>Dupetor flavicollis</i>	Black Bittern	A	LC	
62.	<i>Egretta garzetta</i>	Little Egret	A	LC	*
63.	<i>Elanus caeruleus</i>	Black-shouldered Kite	T	LC	*
64.	<i>Eremopterix grisea</i>	Ashy-crowned Sparrow Lark	T	LC	
65.	<i>Eudynamis scolopacea</i>	Asian Koel	T	LC	*
66.	<i>Falco tinnunculus</i>	Common Kestrel	T	LC	
67.	<i>Francolinus pondicerianus</i>	Grey Francolin	T	LC	*
68.	<i>Fulica atra</i>	Coot	A	LC	
69.	<i>Gallicrex cinerea</i>	Watercock	A	LC	
70.	<i>Gallinula chloropus</i>	Common Moorhen	A	LC	*
71.	<i>Gelochelidon nilotica</i>	Gull-billed Tern	A	LC	
72.	<i>Glareola maldivarum</i>	Oriental Pratincole	A	LC	
73.	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	D	LC	*
74.	<i>Haliastur indus</i>	Brahminy Kite	T	LC	*
75.	<i>Hierococcyx varius</i>	Common Hawk Cuckoo	T	LC	
76.	<i>Himantopus himantopus</i>	Black-winged Stilt	A	LC	
77.	<i>Hirundo rustica</i>	Barn Swallow	T	LC	
78.	<i>Hirundo smithii</i>	Wire-tailed Swallow	T	LC	

79.	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	A	LC	
80.	<i>Ichthyophaga leucogaster</i>	White-bellied sea eagle	T	LC	
81.	<i>Ixobrychus cinnamomeus</i>	Cinnamon Bittern	A	LC	
82.	<i>Ixobrychus sinensis</i>	Yellow Bittern	A	LC	
83.	<i>Limosa limosa</i>	Black-tailed Godwit	A	LC	
84.	<i>Lonchura malacca</i>	Black-headed Munia	D	LC	
85.	<i>Merops orientalis</i>	Green Bee-eater	T	LC	*
86.	<i>Merops philippinus</i>	Blue-tailed Bee-eater	T	LC	
87.	<i>Mesophoyx intermedia</i>	Intermediate Egret	A	LC	
88.	<i>Milvus migrans</i>	Black Kite	T	LC	*
89.	<i>Motacilla flava</i>	Yellow Wagtail	D	LC	
90.	<i>Motacilla maderaspatensis</i>	White-browed Wagtail	T	LC	
91.	<i>Mycteria leucocephala</i>	Painted Stork	A	NT	*
92.	<i>Nectarinia lotenia</i>	Loten's Sunbird	T	LC	
93.	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	A	LC	*
94.	<i>Oriolus oriolus</i>	Eurasean Golden Oriole	T	LC	
95.	<i>Orthotomus sutorius</i>	Common Tailorbird	T	LC	*
96.	<i>Passer domesticus</i>	House Sparrow	T	LC	*
97.	<i>Pelecanus philippensis</i>	Spot-billed Pelican	A	LC	*
98.	<i>Phalacrocorax carbo</i>	Great Cormorant	A	LC	
99.	<i>Phalacrocorax fuscicollis</i>	Indian Shag	A	LC	*
100.	<i>Phalacrocorax niger</i>	Little Cormorant	A	LC	*
101.	<i>Phalaropus lobatus</i>	Red-necked Phalarope	A	LC	
102.	<i>Phoenicopterus ruber</i>	Greater Flamingo	A	LC	
103.	<i>Platalea leucorodia</i>	Eurasian Spoonbill	A	LC	
104.	<i>Plegadis falcinellus</i>	Glossy Ibis	A	LC	*
105.	<i>Ploceus manyar</i>	Streaked Weaver	T	LC	
106.	<i>Pluvialis squatarola</i>	Grey Plover	A	LC	
107.	<i>Porphyrio porphyrio</i>	Purple Swamphen	A	LC	*

108.	<i>Prinia inornata</i>	Plain Prinia	T	LC	*
109.	<i>Prinia socialis</i>	Ashy Prinia	T	LC	*
110.	<i>Psittacula krameri</i>	Rose-ringed Parakeet	T	LC	*
111.	<i>Psilopogon haemacephalus</i>	Coppersmith barbet	T	LC	*
112.	<i>Pycnonotus cafer</i>	Red-vented Bulbul	T	LC	*
113.	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	T	LC	
114.	<i>Rostratula benghalensis</i>	Greater Painted-snipe	A	LC	
115.	<i>Saxicola caprata</i>	Pied Bush Chat	T	LC	*
116.	<i>Saxicoloides fulicata</i>	Indian Robin	T	LC	*
117.	<i>Spilornis cheela</i>	Crested Serpent-Eagle	T	LC	
118.	<i>Sterna albifrons</i>	Little Tern	A	LC	*
119.	<i>Sterna anaethetus</i>	Bridled Tern	A	LC	
120.	<i>Sterna aurantia</i>	River Tern	A	LC	*
121.	<i>Sterna caspia</i>	Caspian Tern	A	LC	
122.	<i>Streptopelia chinensis</i>	Spotted Dove	T	LC	*
123.	<i>Sturnus pagodarum</i>	Brahminy Starling	T	LC	*
124.	<i>Tachybaptus ruficollis</i>	Little Grebe	A	LC	*
125.	<i>Tachymarptis melba</i>	Alpine Swift	T	LC	
126.	<i>Tephrodornis pondicerianus</i>	Common Woodshrike	T	LC	
127.	<i>Terpsiphone paradisi</i>	Asian Paradise-Flycatcher	T	LC	
128.	<i>Threskiornis melanocephalus</i>	Oriental White Ibis	A	LC	
129.	<i>Threskiornis melanocephalus</i>	Black-headed Ibis	A	NT	*
130.	<i>Tringa ochropus</i>	Green Sandpiper	A	LC	*
131.	<i>Tringa stagnatilis</i>	Marsh Sandpiper	A	LC	*
132.	<i>Turdoides affinis</i>	Yellow-billed Babbler	T	LC	
133.	<i>Turnix suscitator</i>	Common Buttonquail	T	LC	
134.	<i>Tyto alba</i>	Barn Owl	T	LC	*
135.	<i>Upupa epops</i>	Hoopoe	T	LC	
136.	<i>Vanellus indicus</i>	Red-wattled Lapwing	D	LC	*
137.	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing	D	LC	*

138.	<i>Zoothera citrina</i>	Orange-headed Thrush	T	LC	
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LC – Least Concern; * - Yes; T – Terrestrial; A – Aquatic; D – Dry/ desert; NT – Near Threatened

Table 3.11.4. IUCN Status of major plant invasive alien species in Pichavaram Mangrove Forest

S. No.	Species	Family	Tamil Name
1.	<i>Argemone mexicana</i>	Papaveraceae	Nai Kadugu
2.	<i>Lantana camara</i>	Verbenaceae	Unnichedi
3.	<i>Martynia annua</i>	Martyniaceae	Thael Kodukku
4.	<i>Parthenium hysterophorus</i>	Compositae	Vishachedi
5.	<i>Prosopis julifera</i>	Fabaceae	Semai karuvel
6.	<i>Senna occidentalis</i>	Caesalpiniaceae	Thagarai
7.	<i>Senna siamea</i>	Fabaceae	
8.	<i>Typha angustifolia</i>	Typhaceae	Sambu
9.	<i>Xanthium indicum</i>	Compositae	Marul oomatham

Table 3.11.5. IUCN Status of major animal invasive alien species in Pichavaram Mangrove Forest

S. No.	Species	Family	Common name	IUCN
A. Mammal				
	<i>Rattus rattus</i>	Muridae	House Rat	LC
B. Reptile				
	<i>Hemidactylus Frenatus</i>	Gekkonidae	House gecko	LC

Table 3.11.6. IUCN Status of major medicinal plant species in Pichavaram Mangrove Forest

S. No.	Species	Family	Tamil Name	Habit
1.	<i>Abrus precatorius</i>	Fabaceae	Kundumani	Climber
2.	<i>Abutilon indicum</i>	Malvaceae	Thuthi	Shrub
3.	<i>Achyranthes aspera</i>	Amaranthaceae	Nayurivi	Herb
4.	<i>Aerva lanata</i>	Amaranthaceae	Peelai, Sirupeelai	Herb

5.	<i>Cardiospermum halicacabum</i>	Sapindaceae	Mudakotthan	Herb
6.	<i>Cynodon dactylon</i>	Poaceae	Aruhampul	Grass
7.	<i>Mukia leiosperma</i>	Cucurbitaceae		Climber
8.	<i>Pedaliium murex</i>	Pedaliaceae		Herb
9.	<i>Phyllanthus reticulatus</i>	Euphorbiaceae	Inki pazham	Shrub
10.	<i>Solanum trilobatum</i>	Solanaceae	Thoodhuvalai	Herb
11.	<i>Tephrosia purpurea</i>	Fabaceae	Kozhinji	Herb
12.	<i>Thespesia populnea</i>	Malvaceae	Poovarasu	Tree
13.	<i>Tinospora cordifolia</i>	Menispermaceae	Seendhil	Climber
14.	<i>Tridax procumbens</i>	Compositae	Vettukkaaya poondu	Herb
15.	<i>Tylophora indica</i>	Asclepiadaceae	Naippalai	Climber
16.	<i>Typha angustifolia</i>	Typhaceae	Sambu	Herb

CHECK LIST

- ✓ Responsible agency has been clearly identified and details of contact person included
- ✓ Wetland/Wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing
- ✓ Wetland/Wetlands complex map has been provided at required scale
- ✓ Zone of influence has been delineated and included in Wetland map or a separate map
- ✓ Wetland zone of influence is sufficient to manage all activities
- ✓ Site's importance have been listed, and for major categories, justification provided
- ✓ Site's biodiversity values are listed, and for major categories, justification provided
- ✓ List of pre-existing rights and privileges provided
- ✓ Consistency or, inconsistency of pre-existing rights and privileges indicated to be best of available knowledge
- ✓ Threats to site listed, and for major categories details provided
- ✓ Activities prohibited, beyond those already listed in Rule 4 (2) have been mentioned
- ✓ List of activities to be regulated within Wetlands and zone of influence is provided
- ✓ List of activities to be permitted is provided