PART – I

CHAPTER - I

Introduction to the Area

Udayamarthandapuram Bird Sanctuary is a 45 ha Protected Area in Tiruvarur District, Tamil Nadu. The Sanctuary is an irrigation tank that is fed by water from Mettur dam, and is in part rainfed by the northeast monsoon that lasts from August until December. The tank remains dry from April until August. A notable aspect of the sanctuary is the large congregation of Purple Moorhens and Open bill storks that visit during February-March. The Sanctuary is also s home to other migratory water birds including Coot, Grey Heron, White Ibis, Night Heron, Purple Heron, Little cormorant, Darter, Spoonbill, Indian Reef Heron and White-necked stork. Records of the Tamil Nadu Forest Department indicate that in recent years, Little Terns, Pelicans and Painted Storks have also started visiting the sanctuary. Birding season typically commences in September, with the bird population peaking during November- December with up to 10,000 birds.

Udayamarthandapuram Bird Sanctuary has been listed amongst the top ten heronries ofTamil Nadu. The important species nesting here include Little Cormorant, Darter, Grey Heron and Eurasian Spoonbill. The heronry at Udayamarthandapuram, like other heronries of Tamil Nadu, originated as a roosting site for birds but soon evolved into a nesting site, since the requirements for both are more or less the same for large water birds.

In the beginning, most heronries start as small nascent breeding colonies with a few nesting birds. Given adequate protection, the colony grows in size, both in terms of species composition and numbers. In certain situations, such sites have turned into safe nesting sites, mainly due to the lack of any serious disturbance and the presence of adequate protection. Udayamarthandapuram bird sanctuary has been actively protected by villagers over the years. The effort to curb poaching eventually evolved

into a point of the entire village passing resolutions to save the birds. Active follow-up action by local people and a village youth association finally led to the site being declared a bird sanctuary.

1.1 Name: Udhayamarthandapuram Bird Sanctuary

Udayamarthandapuram is one of the important Bird Sanctuaries in Tamil Nadu, located just one km off the East Coast Road that connects Chennai and Tuticorin. It is under the administrative jurisdiction of Thiruturaipoondi taluk, Muthupet Block. The road on which the sanctuary is located is referred to as the Mannargudi – Udayamarthandapuram road. This Sanctuary is well known for sighting large number of Asian Open bill Stork, a globally endangered water bird. The Sanctuary was created in 1999, is located near the confluence of Baminiaar and Kannanaar rivers and covers a total area of 45.3 hectares.

1.2. Location:

It is located between 10°26′59″N79°27′58″E in Tiruthuraipoondi Taluk of Tiruvarur District in Tamil Nadu. Muthupet, the nearest town, is located 10 kilometers from the bird sanctuary.

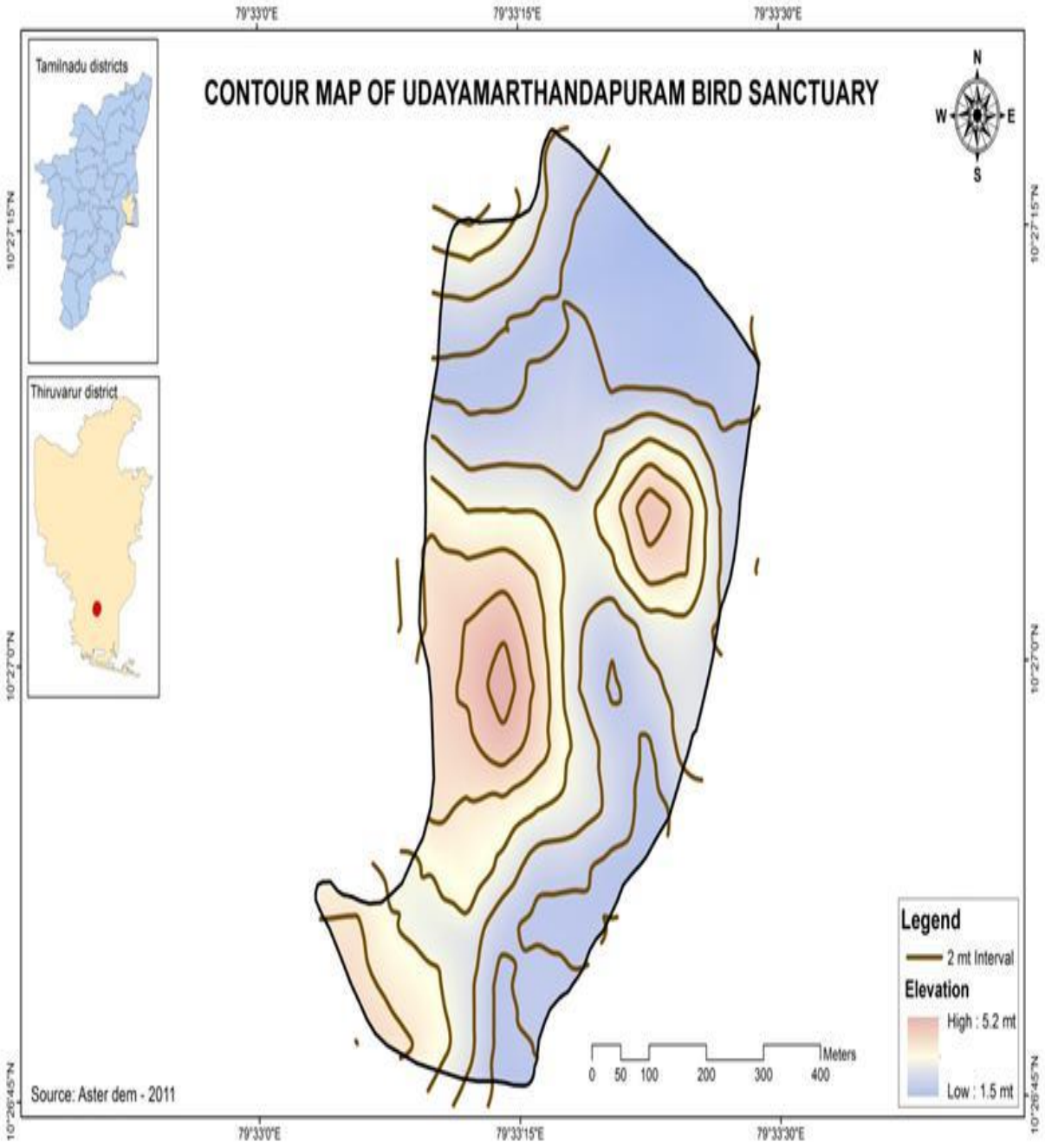
1.3. Constitution

The sanctuary was created under Section 26A of Indian Wildlife Protection Act 1972 as per G.O.No.379, Environment & Forest (FRV) Department, Dt. 31.12.98. The total area of the sanctuary is 45.28.5 Ha. (Survey No: R.S.No. 11-1 of Udayamarthadapuram Village).

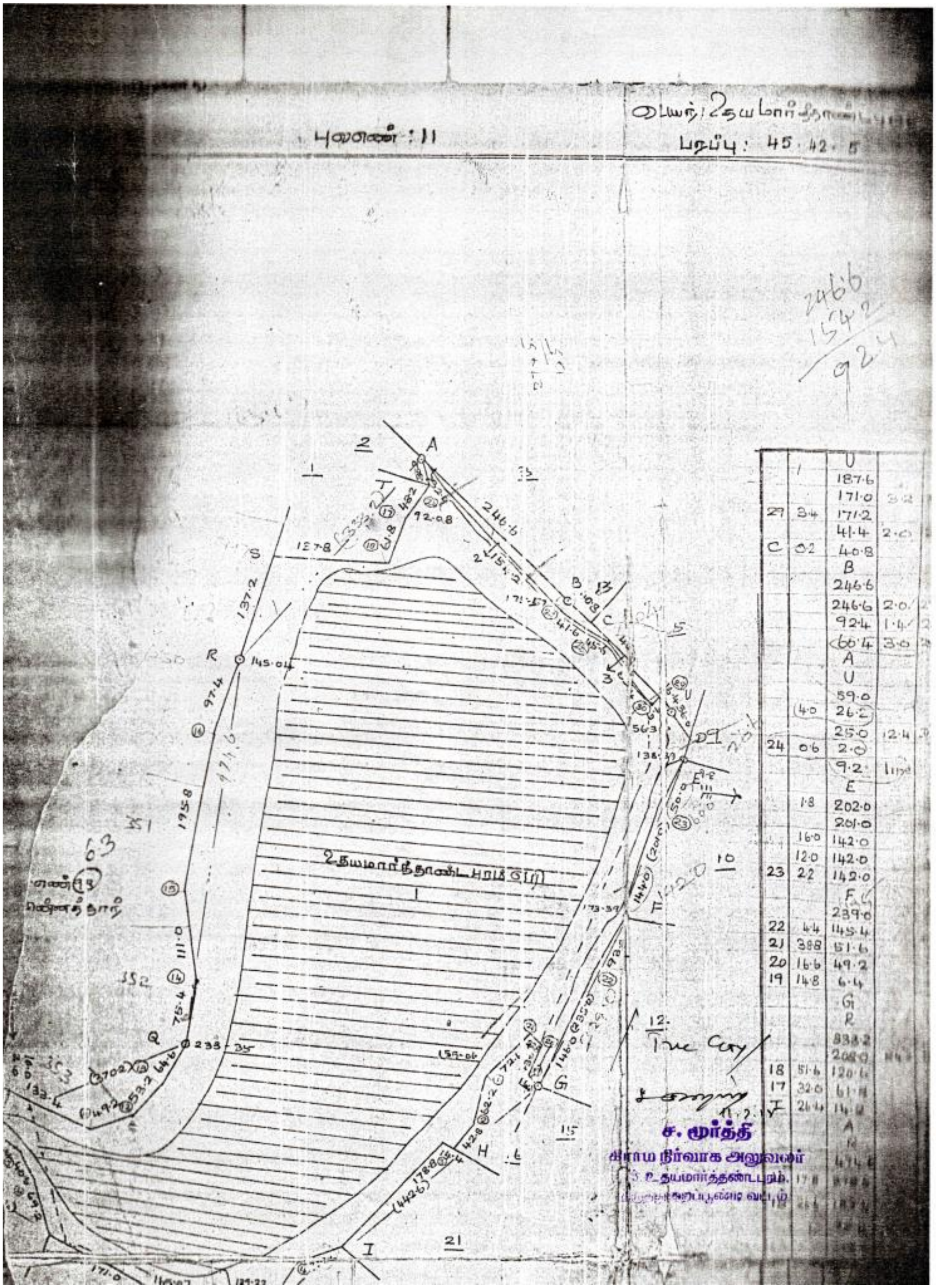
1.4. The Extent of Area

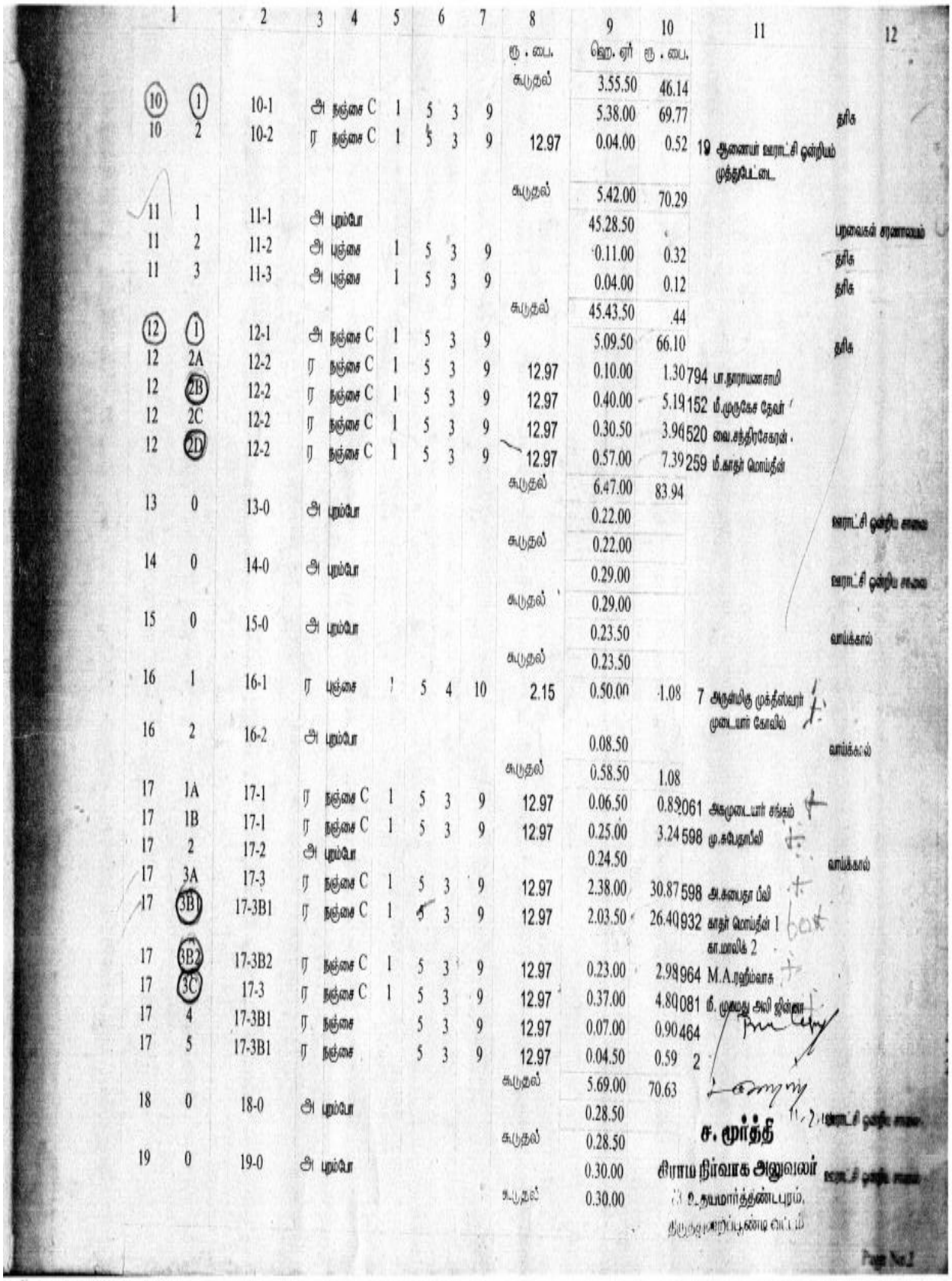
The total extent of the protected area of the bird sanctuary is 45.285 Ha.Topography of the Udayamarthandapuram bird sanctuary is flat with an elevation of nearly 4 m msl. The sanctuary represents an inland type of wetland. Such kinds of wetlands are most common on floodplains along rivers and streams. Udayamarthandapuram is

an inland wetland. The sanctuary encompasses floodplain and agricultural ecosystems. The sanctuary falls under East coast biogeographic zone as defined by the Wildlife Institute of India and the Eastern Ghats and Tamil Nadu Uplands and Deccan (Karnataka) Plateau, hot semiarid eco-region (H1D2) [*Tamil Nadu Uplands and Plains, hot moist semi-arid ESR with deep red loamy soils, low AWC and LGP 120-150 days (H1Dm4)*] as defined by ICAR.



Source: CareEarth /TBGP/Wetland Action Plan 2013-18

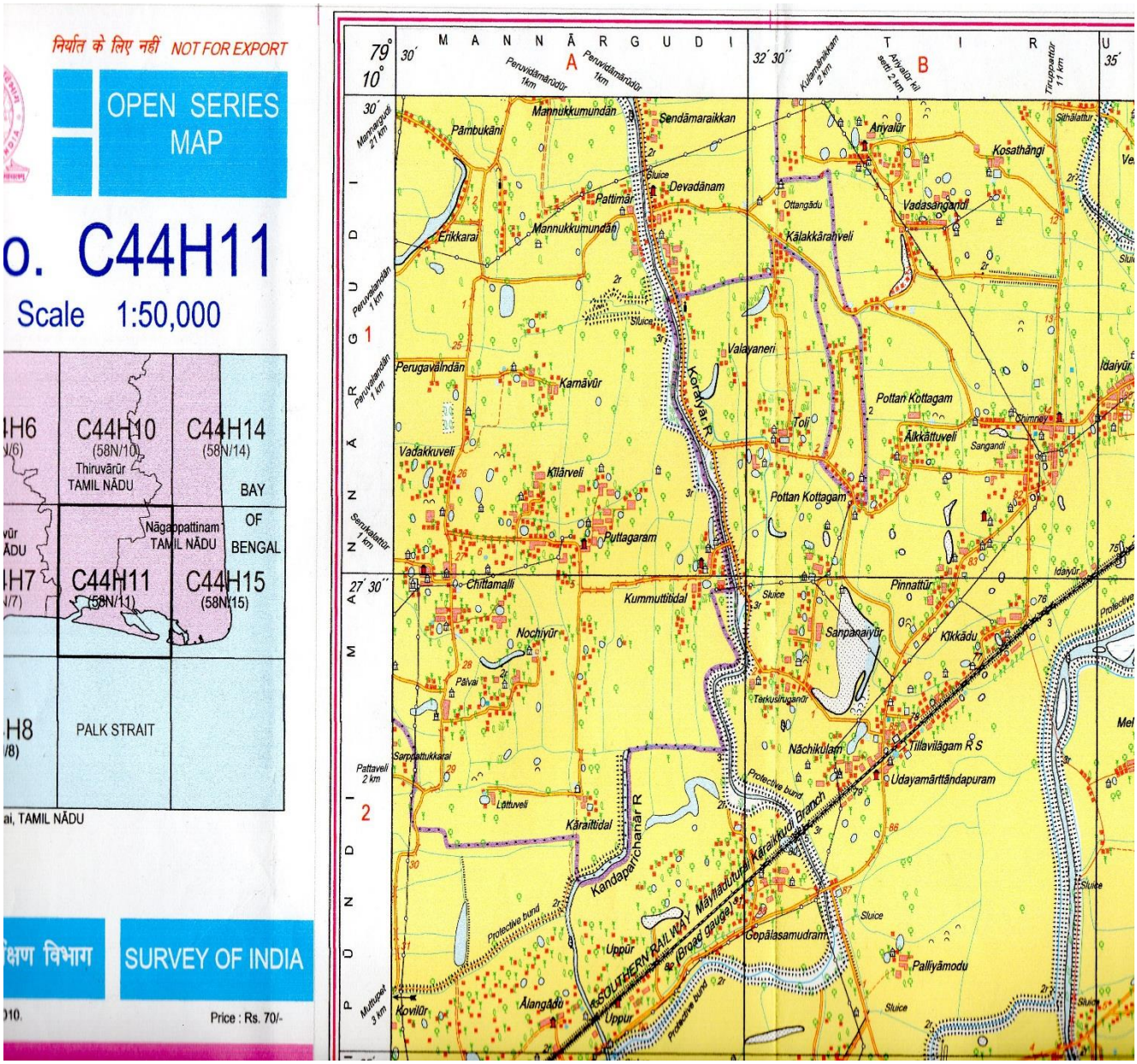

புலஎண் : 11
பெயர்: உதயமார்த்தாண்டபுரம்
பரப்பு: 45.42.5
உதயமார்த்தாண்டபுரம் ஏரி
1
True Copy
ச. மூர்த்தி
கிராம நிர்வாக அலுவலர்
உதயமார்த்தாண்டபுரம்



1	2	3	4	5	6	7	8	9	10	11	12
							ரூ . பை.	ஹெ. ஏர்	ரூ . பை.		
							கூடுதல்	3.55.50	46.14		
(10)	(1)	10-1	அ நஞ்சை C	1	5	3 9		5.38.00	69.77		தரிசு
10	2	10-2	ர நஞ்சை C	1	5	3 9	12.97	0.04.00	0.52	19 ஆனையர் ஊராட்சி ஒன்றியம் முத்துப்பேட்டை	
							கூடுதல்	5.42.00	70.29		
11	1	11-1	அ புறம்போ					45.28.50			பறவைகள் சரணாலயம்
11	2	11-2	அ புஞ்சை	1	5	3 9		0.11.00	0.32		தரிசு
11	3	11-3	அ புஞ்சை	1	5	3 9		0.04.00	0.12		தரிசு
							கூடுதல்	45.43.50	.44		
(12)	(1)	12-1	அ நஞ்சை C	1	5	3 9		5.09.50	66.10		தரிசு
12	2A	12-2	ர நஞ்சை C	1	5	3 9	12.97	0.10.00	1.30	794 பா.நாராயணசாமி	
12	(2B)	12-2	ர நஞ்சை C	1	5	3 9	12.97	0.40.00	5.19	152 மீ.முருகேச தேவர்	
12	2C	12-2	ர நஞ்சை C	1	5	3 9	12.97	0.30.50	3.96	520 வை.சந்திரசேகரன் .	
12	(2D)	12-2	ர நஞ்சை C	1	5	3 9	12.97	0.57.00	7.39	259 மீ.காதர் மொய்தீன்	
							கூடுதல்	6.47.00	83.94		
13	0	13-0	அ புறம்போ					0.22.00			ஊராட்சி ஒன்றிய சாலை
							கூடுதல்	0.22.00			
14	0	14-0	அ புறம்போ					0.29.00			ஊராட்சி ஒன்றிய சாலை
							கூடுதல்	0.29.00			
15	0	15-0	அ புறம்போ					0.23.50			வாய்க்கால்
							கூடுதல்	0.23.50			
16	1	16-1	ர புஞ்சை	1	5	4 10	2.15	0.50.00	1.08	7 அருள்மிகு முத்தீஸ்வரர் முடையார் கோவில்	
16	2	16-2	அ புறம்போ					0.08.50			வாய்க்கால்
							கூடுதல்	0.58.50	1.08		
17	1A	17-1	ர நஞ்சை C	1	5	3 9	12.97	0.06.50	0.89	061 அகமுடையார் சங்கம்	
17	1B	17-1	ர நஞ்சை C	1	5	3 9	12.97	0.25.00	3.24	598 மு.சுபதாவி	
17	2	17-2	அ புறம்போ					0.24.50			வாய்க்கால்
17	3A	17-3	ர நஞ்சை C	1	5	3 9	12.97	2.38.00	30.87	598 அ.சுபைதா பீவி	
17	(3B1)	17-3B1	ர நஞ்சை C	1	5	3 9	12.97	2.03.50	26.40	932 காதர் மொய்தீன் 1 கா.மாலிக் 2	
17	(3B2)	17-3B2	ர நஞ்சை C	1	5	3 9	12.97	0.23.00	2.98	964 M.A.ரஹீம்ஷாசு	
17	(3C)	17-3	ர நஞ்சை C	1	5	3 9	12.97	0.37.00	4.80	081 மீ. முகமது அலி ஜின்னா	
17	4	17-3B1	ர நஞ்சை		5	3 9	12.97	0.07.00	0.90	464	
17	5	17-3B1	ர நஞ்சை		5	3 9	12.97	0.04.50	0.59	2	
							கூடுதல்	5.69.00	70.63		
18	0	18-0	அ புறம்போ					0.28.50			ஊராட்சி ஒன்றிய சாலை
							கூடுதல்	0.28.50			
19	0	19-0	அ புறம்போ					0.30.00			ஊராட்சி ஒன்றிய சாலை
							கூடுதல்	0.30.00			

சு. மூர்த்தி
கிராம நிர்வாக அலுவலர்
உதயமார்த்தண்டபுரம்.
திருத்துறைப்பூண்டி வட்டம்

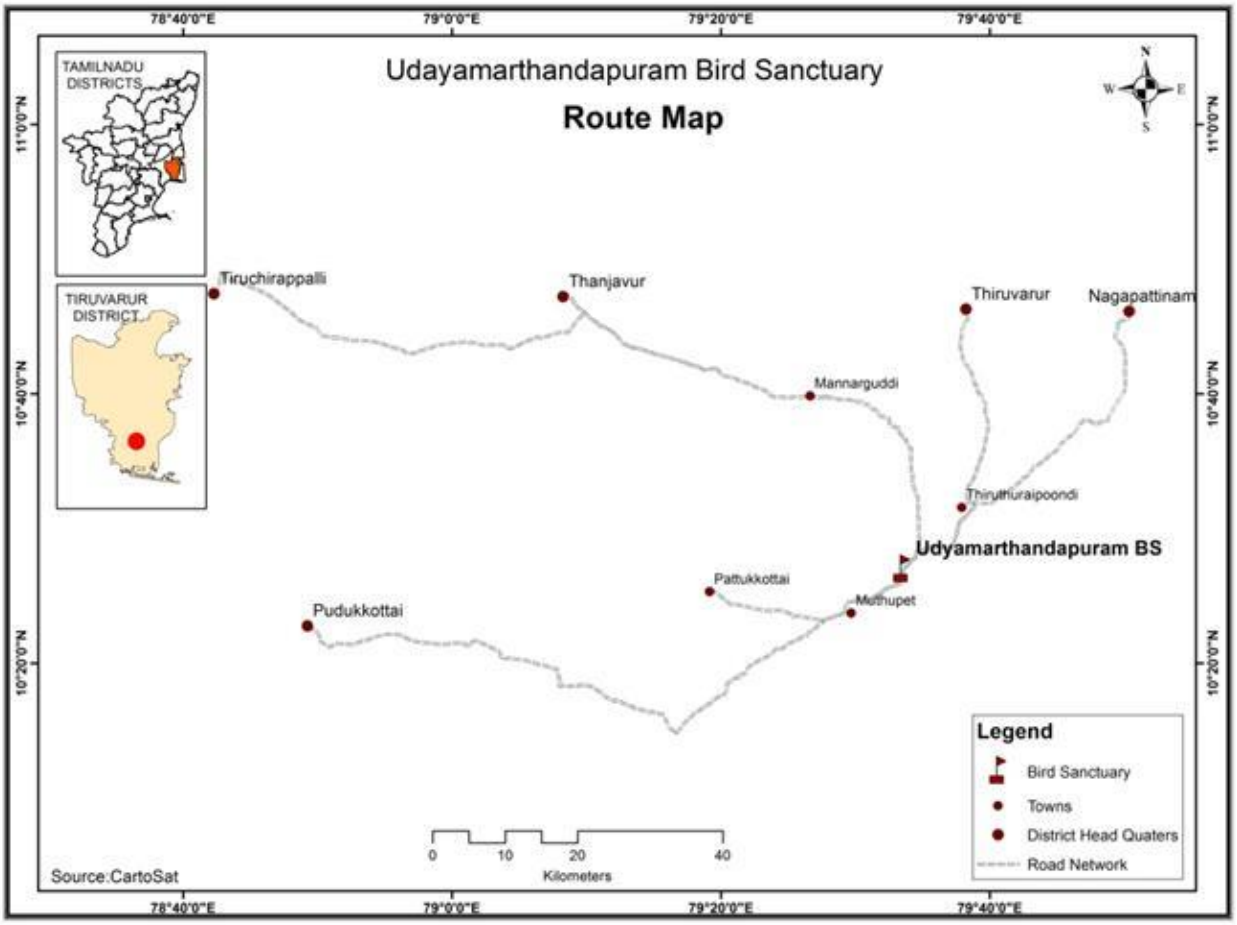
Page No.1



Location of Udayamarthandapuram Bird Sanctuary in SI Sheet Map

1.5 Approach and Access

The sanctuary is approachable by road from Thiruthuraipoondi at a distrance of 15 kms and Muthupet which is 10 Kms away, the nearest railway station is Muthupet, currently under maintenance and repair. The sanctuary is accessible throughout the year. There are no motorable roads inside the sanctuary, but the bund of the sanctuary tank forms a footpath that provide access to the sanctuary all-round the year.



Source: CareEarth /TBGP/Wetland Action Plan 2013-18

1.6 The Statement of Significance

The sanctuary is an important Roosting Site for local migrants and resident water bird rather than feeding and wintering grounds for the long distant migrant water bird such as Ducks and Waders. The common generalists bird species of this area are; Black-crowned Night Heron *Nycticorax nycticorax*, Little Cormorant *Phalacrocorax niger*. It is interesting that the sanctuary probably supports the largest congregation of Open bill Stork, *Anastomus oscitans* (over 5,000). Other notable species which congregate in significant numbers during dusk hours for roosting is the Oriental White Ibis *Threskiornis melanocephalus*. The habitat diversity within the sanctuary is ideal for the three resident species of ducks to breed namely; Lesser Whistling Duck *Dendrocygna javanica,* Comb Duck *Sarkidiornis mealanotos* and Spotbilled Duck *Anas poecilorhyncha.* Other species which breed here on thereed beds and floating vegetation are Indian Purple Moorhen, *Porphyrio porphyrio*, Indian Mooorhen *Gallinulla chloropus*Pheasant-tailed Jacana *Hydrophasianus chirurcus*, White-breasted Water-hen *Amaurornis phoenicurus*. Ground nesting bird of importance for the sanctuary is the Red-wattled Lapwing *Vanellus indicus*. A small number of migratory and partially resident birds such as the Common Coot *Fulica atra* utilizes this wetland for nesting. Among the heronry species which occasionally visit in small numbers are the Spotbilled Pelican *Pelecanus philippensis*, Paninted stork *Mycteria leucocephala*, Eurasian Spoonbill *Platalea leuccorodia* However, the fabulous sight of many thousands birds congregating for roosting on the different regions of the canopy is a very attractive sight for the common man to cherish the beauty of the birds. The daily arrival of roosting birds in the dusk and departure to neighboring wetlands and paddy fields for feeding in the dawn in large numbers is the unique feature of this sanctuary which isincomparable to other sanctuaries of Tamilnadu. Robust management measures will enable the sanctuary to attract more breeding s and wintering species thereby enhancing the diversity. This would contribute to a situation of more tourist inflow, while being a nature reserve for birdwatchers and students.

Panoramic view of the Udayamarthandapuram Bird Sanctuary in Thiruvarur District

An ideal habitat for aquatic birds throughout the year with rich plant diversity and abundance

CHAPTER - II

Background Information and Attributes

2.1. Boundaries

North

The boundary starts from Udhayamarthandapuram Village R.S.No.Part of 1 and 2,3,4,5,6,7,8,-1, 2A, 2B, 9-1A, 9-1B, 9/2 covering wetlands and designated wastelands.

East

Thence the boundary runs from Udhayamarthandapuram R.S.No.10-1, 10-2, 11,12,13,14,15,16,17,18,19,20,21,22-1A, 22-1B, 22/4A, 22/4B, 22-2, 3A, 23 covering wetlands designated wastelands and roads.

South

Thence the boundary runs from Udhayamarthandapuram R.S.Nos.32,34,37 which are the wetlands.

West

Thence the boundary ends in 08 Pinnathur Village, R.S.No.337/6, 337-1 to 13, 388, 339-1 to 3,4,346,347/1, 2 to 9, 348, 349,350,351,352,354 covering irrigation canals, Wetlands and designated wastelands.

The Sanctuary is bound by Pinnathur village in North, Naachikulam village in South, Udayamarthandapuram village in East and Sirupanaiyur in village in West.

2.2 Geology Rock and Soil

Two types of soils are present in Udayamarthandapuram Bird Sanctuary namely black cotton and sandy alluvium soil.Fresh alluvium soil is deposited on an annual basis by the irrigation flows of the upstream reservoirs and canals.

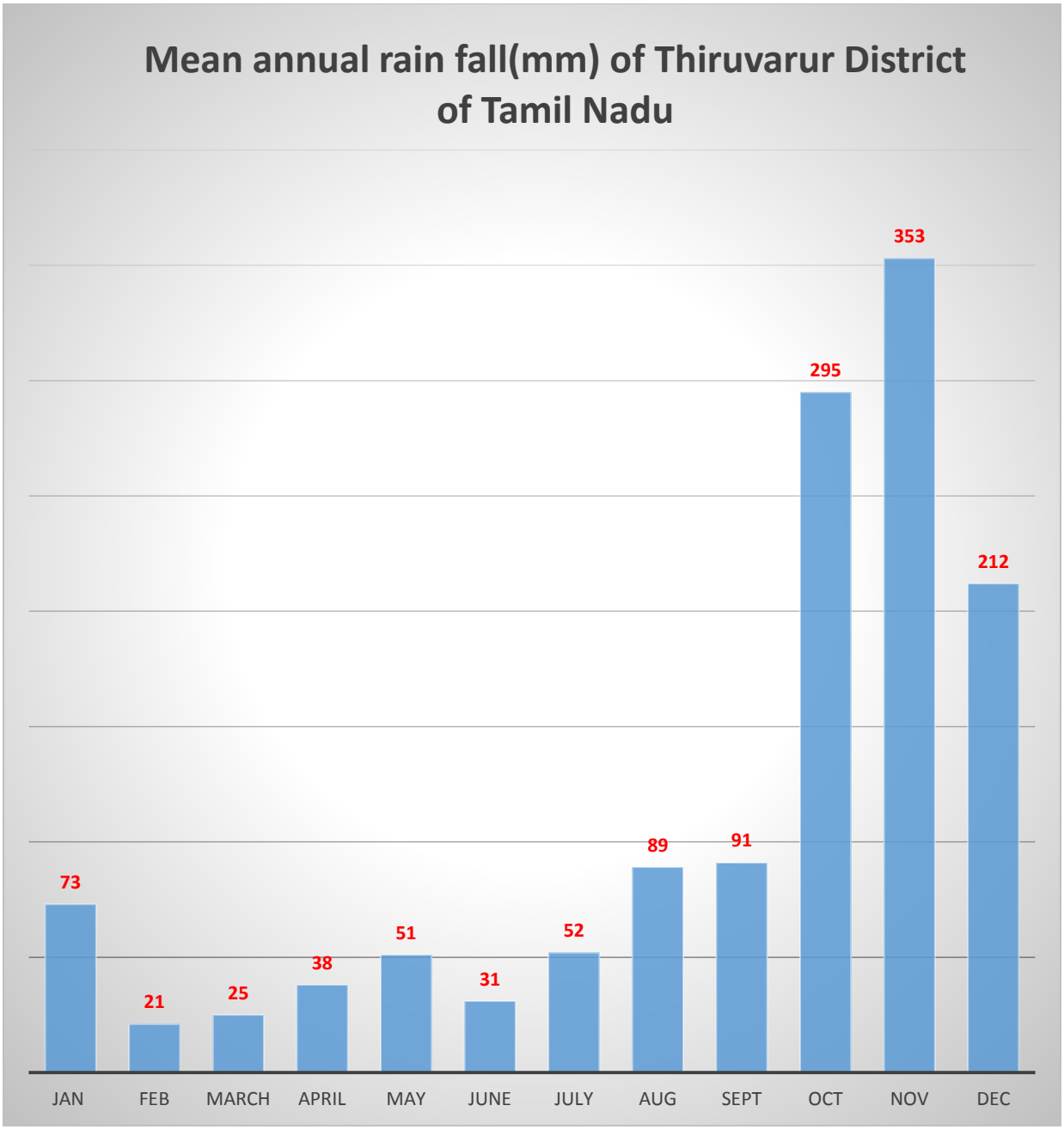
2.3 Terrain

The sanctuary terrain is flat with a gentle slope from West to Wast. The wetland within the sanctuary has lost its original depth due to years of siltation. No de-silting operation had been carried out in the sanctuary for the last 10 years. Prior to declaration of sanctuary there was the practice of removing soil by the local people (*vandal*) from the tank bed for nearby paddy fields. This is, however, not practiced anymore.

2.4 Climate

This area receives rainfall mainly from the north-east monsoons from October to December. The remaining months are dry except for some occasional showers from cyclonic depressions. The average annual rainfall of this area is around 1200mm, which is broadly defined as mid rainfall regime. The rainy months are generally pleasant. Temperature starts rising from March onwards and May and June are generally the hottest months.

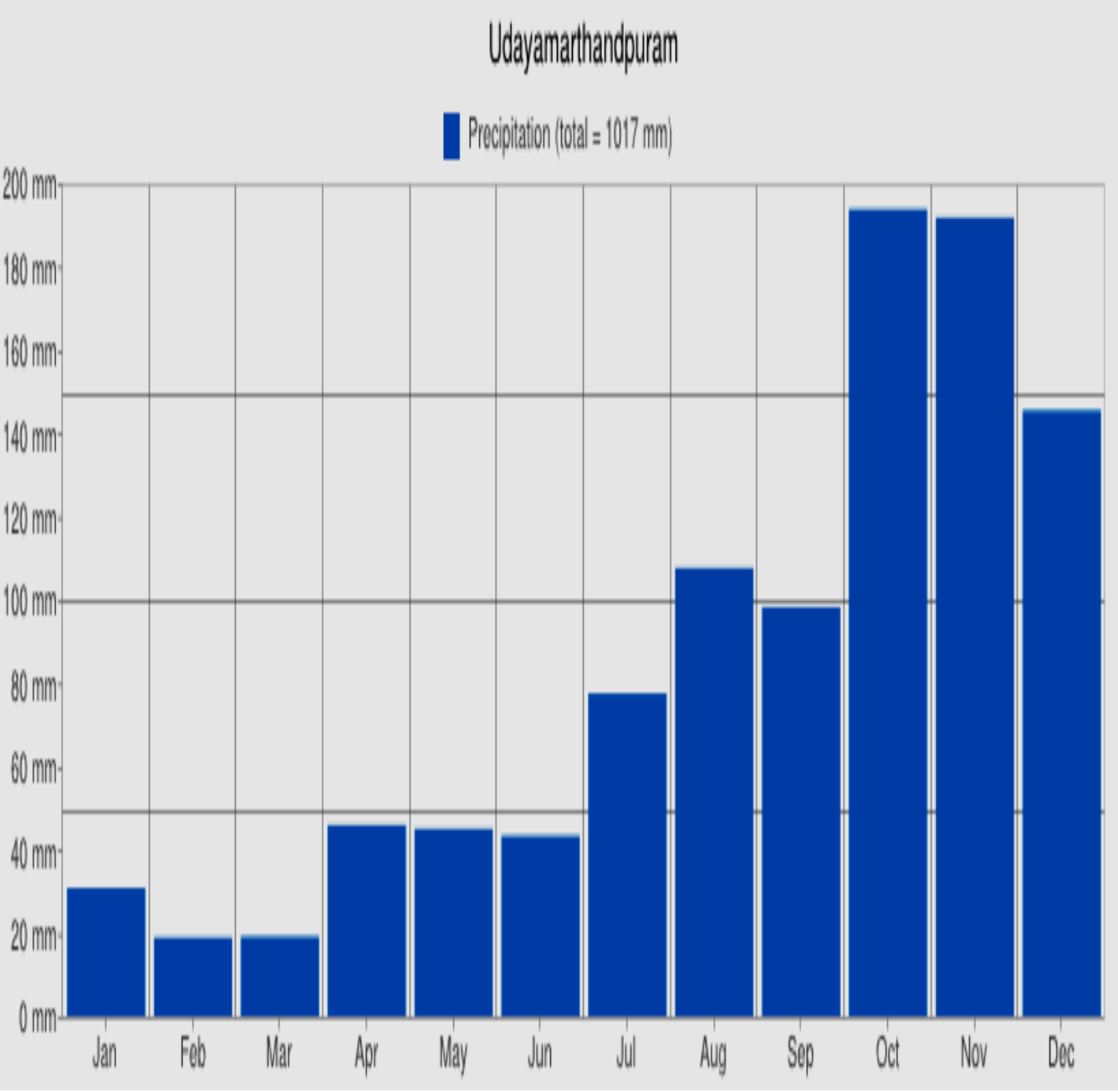
Rainfall Details of Udayamarthandapuram Bird Sanctuary



(*http://agricoop.nic.in/Agriculture%20contingency%20Plan/TN/TN14-Thiruvarur%203.2.2011.pdf*)

Source: CareEarth /TBGP/Wetland Action Plan 2013-18

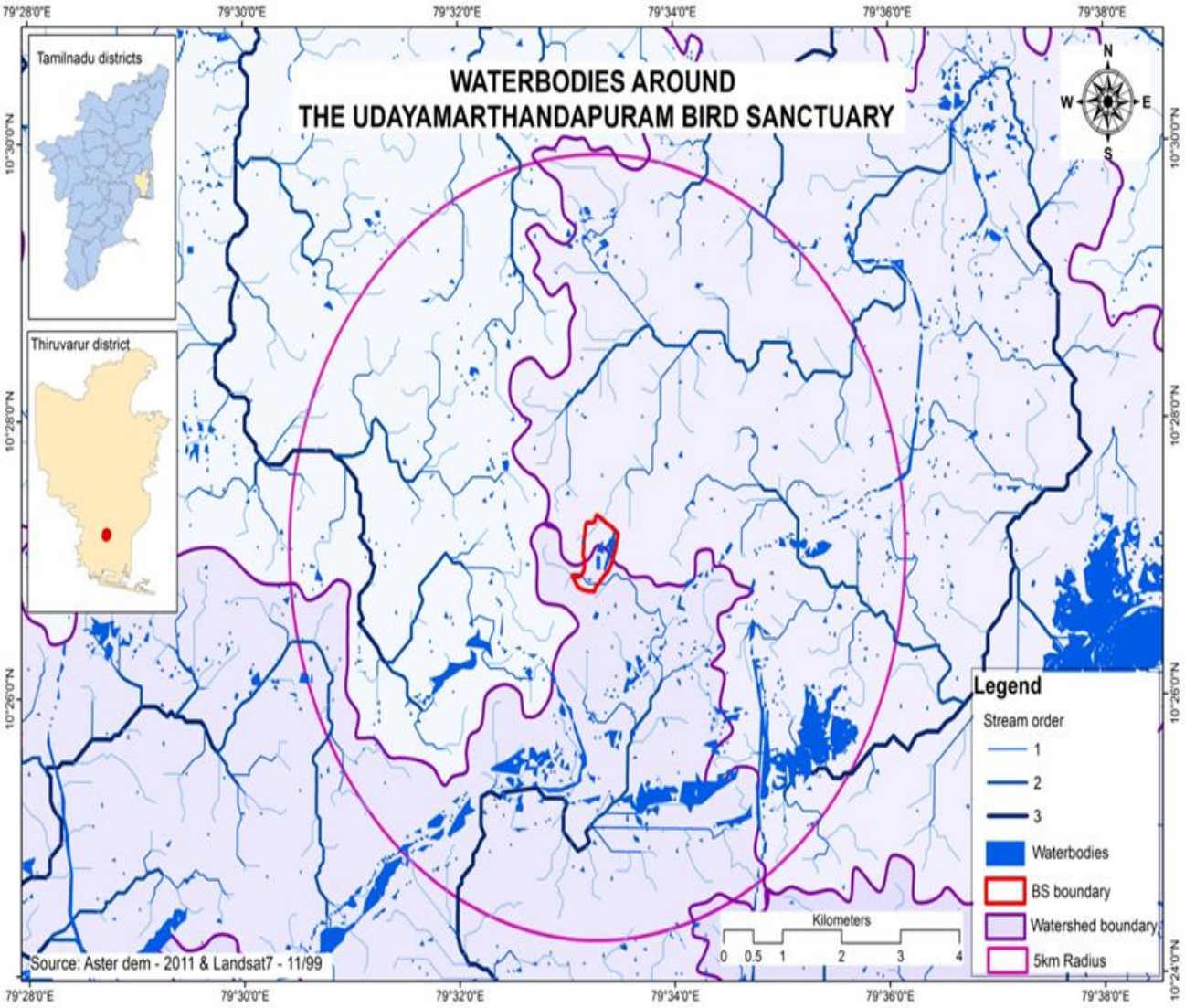
The Diagramme showing the precipitation Details of Udayamarthandapuram Birds Sanctuary



(Source of data: CRU CL 2.0 which is described in New, M., Lister, D., Hulme, M. and Makin, I., 2002: A high-resolution data set of surface climate over global land areas. Climate Research 21:1-25 and Aquastat)

2.5 Water Sources

Udayamarthadapuram BS does not have a perennial water source. The sanctuary is primarily an irrigation tank used for storing water for agriculture. It receives water from Mettur dam from July that is supplemented by the northeast monsoons from October till January. The sanctuary starts getting dry from February onwards and goes completely dry from April till arrival of fresh water from Mettur.



Source: CareEarth /TBGP/Wetland Action Plan 2013-18

Waterbodies around Udayamarthandpuram bird sanctuary

2.6 Flora

As the sanctuary is basically an irrigation tank, there is no natural terrestrial forest within the sanctuary. *Inca dulce* and *Acacias*, planted on the earthen mounds, are the major tree species of the sanctuary. Other species include *Zizyphus, Pongamia pinnata, Acacia leucopholea, Lannea coromandelica, Albizzia lebbeck*. Most part of the tank bed has been encroached by a variety of weeds and reeds. *Acacia nilotica* plantations had been raised by social forestry in 1985 and 1986 and these trees had covered a great part of the sanctuary in the past. However the trees gradually died and only those on the bund remain.

2.7 Bird Fauna: Diversity and Richness

The sanctuary is home to a large number resident and migratory water birds. The migratory birds start arriving in the sanctuary from August onwards coinciding with the arrival of irrigation water from Mettur dam. The arrivals increase after onset of northeast monsoon in October. Bird population generally peaks sometime in December and then starts declining. By March, most of the birds leave the landscape, except for Open bill Storks who are the last to leave. Interestingly, the population of Open bill Storks peak during February-March when the tank bed is almost dry and the ground is full of snails for easy picking. Prior to the formation of mounds and planting of trees, the sanctuary was not much favoured by the birds. With the formation of earthen mounds and planting of shade and roosting species, the sanctuary has become a regular visiting place for water birds.

The Udayamarthandapuram Bird Sanctuary is known for aquatic vegetation

Purple moorhen, a key species in the aquatic habitats

Suitable of vegetation for Purple Moorhen

Diversity of aquatic vegetation is the deciding factor for the wintering birds

A wide diversity of aquatic grass species provides adequate food resources to birds

Submerged and floating vegetation offers a better habitat to the wintering birds

Overall, 40 water bird species have been reported within the sanctuary. Many of the species are listed in the appendices of the Convention of Migratory Species of Wild Animals (CMS, 1982). A few species are also those that are included under the CITES appendices. A few species are covered in the Central Asian Flyway Action Plan (CMS 2006). Representative counts of some selected sample points in the sanctuary, indicate that the highest number of species was recorded during October to May, with a maximum of 40 species recorded. Likewise, the total numbers of birds vary widely through the year and from a minimum in June-September/October numbers rise during November to May.

Other faunal diversity includes aquatic and terrestrial insects and their larvae, small to large sized fish, amphibian, molluscs and slugs, crustacean, worms and even rodents. An assessment of the abundance and availability of the different prey species throughout the year at the sanctuary and associated wetlands is required to manage these water birds (See Appendices)

2.8 Habitat

The natural vegetation of the wetlandcomprises of emergent, floating and submerged plant species that are evenly distributed. Evidently, the distribution is influenced by the hydrological regime of the wetland. Exotic species like *Eichhornia crassipes, Salvinia auriculata, Pistia stratiotes, Lemna minor, Wolffia sps*. And*Azolla pinnata* often form thick mats in different pockets of the wetland. Speices ofrooted floating-leaf types commonly found in the wetland are: *Nymphaea stellata, Nelumbium speciosum, Nymphoides indicum, Ipomoea aquatica, Neptunia oleracia, Ludwigia adsc endens,Pseudoraphis spinosus* and *Echinochloa colonum*. Among the aquatic communities, submerged and the free floating macrophytes are less productive compared to other plant communities in spite of their prolific growth and invasion in the aquatic systems, as they contain very little drymatter.

Habitat management is done primarily to remove exotic species and maintenance of native vegetation cover for water quality maintenance The wetlandhas an excessive growth of invasive species often forming dense mats, the most common being *Ipomea aquatica, Eichhornia crassipes, Salviniasuriculata, Ottelia alismoies*. Prolific growth of vegetation in the lake is primarily attributed to high concentrations of in organic nutrients present in the tankwaters, entering the tankin the form of agricultural run-off through various deltaic drains and channels. Several attempts made to eradicate the weeds by mechanical means, have been successful due to the small size of the sanctuary. Uses of chemical methods for control of weeds isnot recommended in light of their potential harmful impacts.

Pheasant –tailed Jacana is abundant in numbers and also breeding in the sanctuary

2.9 Bird Diversity

More than 13,000 birds visit the sanctuary and the number goes up to 20,000 in winters, representing 40 species of birdspecies. The sanctuary probably supports the largest congregation of Openbill Stork, *Anastomus oscitans* (more than 5,000). The other notable species which congregate more numbers during dusk hours for roosting includes Oriental White Ibis *Threskiornis melanocephalus*. Three resident species of ducks namely Lesser Whistling Duck *Dendrocygna javanica* Comb Duck *Sarkidiornis mealanotos* and Spotbilled Duck *Anas poecilorhyncha* are known to breed here. The other species which breed here on the reed beds and floating vegetation are Indian Purple Moorhen, *Porphyrio porphyrio*, Indian Mooorhen *Gallinulla chloropus*, Pheasant-tailed Jacana *Hydrophasianus chirurcus*, and White-breasted Water-hen *Amaurornis phoenicurus*.

10. Flagship Species

The flagship species of Udayamarthandapuram bird sanctuary are the Oriental Darter and Glossy Ibis. The sanctuary was historically known for being a significant breeding site for the Spot billed Pelican

2.11 Symbiotic Relationship

The symbiotic relationship of the sanctuary is fostered by the presence of large patches of wetlands at varying depths, typified by aquatic vegetation and the narrow bunds that support native species of trees, shrubs and grasses. Buffered by large tracts of agriculture in the immediate vicinity, the sanctuary is typical of a symbiotic system of wetland-cultivation-bird diversity. Between plant diversity in the tank and other macrophytes are noticed which influence various micro flora and fauna those are beneficial to bird species.

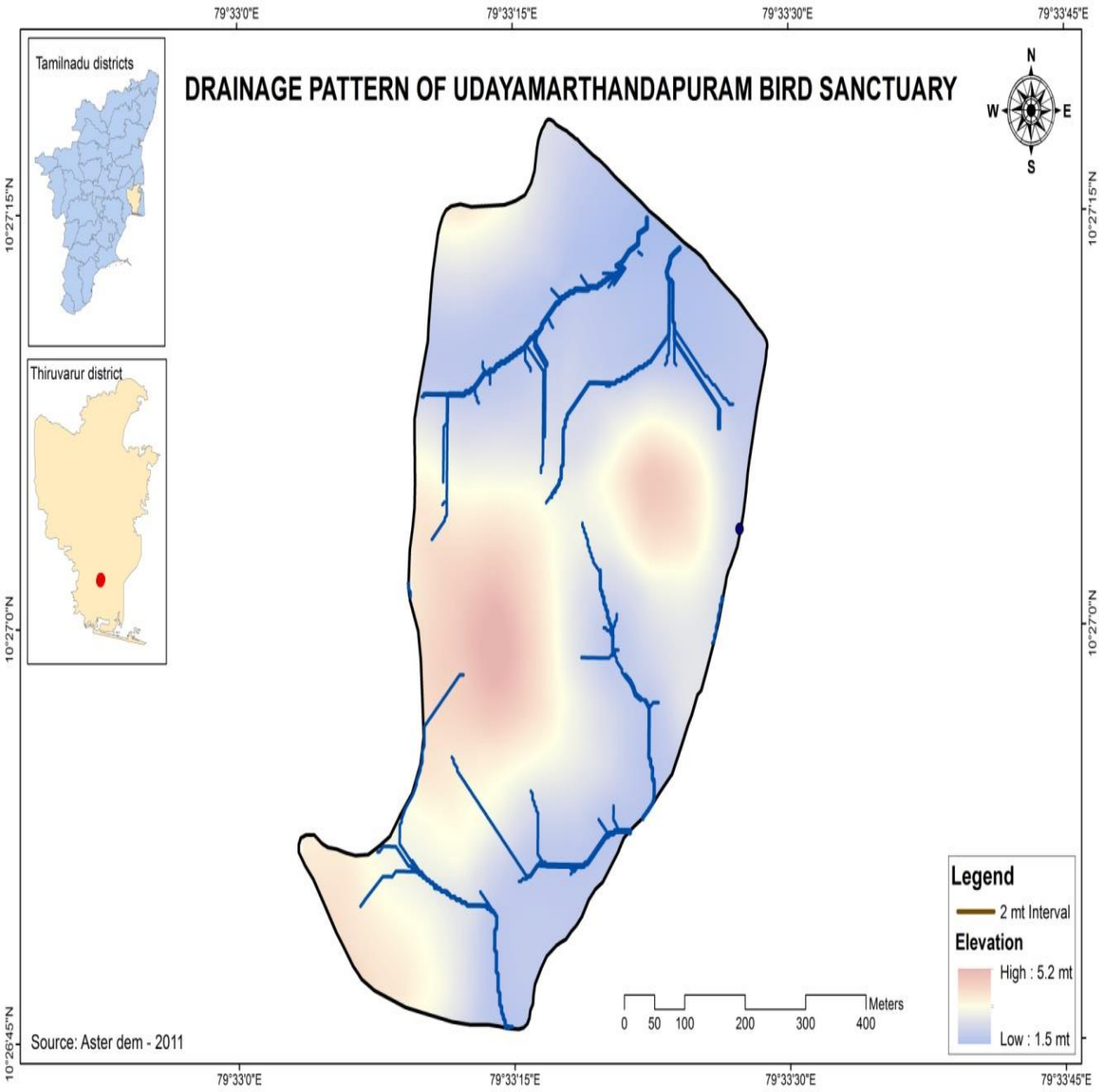
2.12 Hydrology

The sanctuary is basically an irrigation tank, under the jurisdiction of the Public Works Department. The wetland is fed by water from Mettur dam and by the northeast monsoon from August till December. It remains dry from April till August. It is mainly a freshwater habitat, hence not much seasonal fluctuation in salinity is observed. The southern part of the landscape of which UBS is a part of has the Koraiyar River running West to East to finally drain into the Muthupet mangroves. The wetland is fed by canals which get water from Mettur dam.The direction of flow of water is seasonal and surface runoff of water is low. Like most wildlife populations, waterbird population trends largely reflect the abundance of quality habitat, and breeding habitat quality is often related to water levels, precipitation, and recent climatic conditions.

2.13 Drainage Pattern

The district falls in Cauvery sub-basin. The tributaries of the river Cauvery are Vennar, Vettar and Bamini rivers flowing through the district. There are 13 irrigation canals branching from these rivers and 34 irrigation tanks which serve as major source of irrigation the district. Out of 34 tanks in the district Mannargudi taluk accounts for 22, followed by Thiruthuraipoondii. Surface water canals are the major source of irrigation water accounting for about 89% of the area irrigated in the district, whereas dug wells and tube wells account for 11%.

Source from Wetland Action Plan 2013-18 Prepared By Care Earth



2.14. Crucial Parameters of the Bird Sanctuary

The Udayamarthandapuram Bird Sanctuary is influenced by a set of ecological parameters which influences the presence and continued survival of bird species. These are:

1. The Wetland Eco-system
2. Water Regime
3. Sharing of water for human and ecological purposes
4. Biodiversity value
5. Presence of agriculture fields in and around the sanctuary
6. People's dependence on the wetland
7. Robust institutional mechanism

2.15 Dependence

Although agriculture is the main source of livelihood around the bird sanctuary, cattle rearing also supports livelihood of villagers during lean period of agriculture. The total livestock population is 7760 around the bird sanctuary including 2620 cattle, 3730 goat/sheep and 1410 poultry. All the villages except Tholi village own more than 500 livestock. Large scale cattle and goat grazing is prevalent within the immediate periphery of the sanctuary since there is no separate grazing land for the cluster of villages. Villagers also rear cattle on abandoned agricultural land (fallow lands) during the lean agricultural seasons or use paddy straw and grass as fodder. Poultry keeping is limited to individual, household level. Fire wood is also collected in areas around the sanctuary.

CHAPTER – III

History of Management and Present Practices

3.1 General

The earlier management plan is based on evaluation of hydrological, ecological and socio economic features of Udayamarthandapuram Wetland and the associated watershed. The main emphasis of the present Integrated Management Plan is on eco-restoration of Udayamarthandapuram Lake while providing sustained economic benefits to the stakeholders through conservation activities. The IMP broadly focuses on biodiversity conservation and maintaining ecological processes and functions through land and water management for the long term benefit of the migratory birds.

3.2 Infrastructure Facilities Available

A rather minimum level of infra structure facilities (for staff and tourists) isavailable in the Udayamarthadapuram Bird Sanctuary, despite its uniqueness in terms of migratory birds and other biodiversity components. It is necessary to develop infra structure facilities in a comprehensive manner for tourists.

3.4 Live stock grazing

As stated in the previous sections, the landscape is typified by the presence of a large number of cattle and sheep. Livestock grazing inside the sanctuary is a major source of conflict between the villagers and Forest department. As the sanctuary covers a large area and almost dries up in the summer season the villagers graze their cattle inside the sanctuary in the absence of alternative sites for grazing. Some of the residents report this to be a customary right of the village.

3.5 Invasive Alien Species

The wetland has witnessed excessive growth of invasive species often forming dense mats, the most common being *Ipomea aquatica, Eichhornia crassipes, Salviniasuriculata, Ottelia alismoies*,. Prolific growth of vegetation in the lake is primarily attributed to high concentrations of inorganic nutrients present in the lake waters, entering the lake in the form of agricultural run-off through various deltaic drains and channels. Several attempts made to eradicate the weeds by mechanical means, have been successful due to the small size of the sanctuary. Uses of chemical methods for control of weeds are not recommended in light of their harmful impacts. Management of vegetation by control of invasive exotic species therefore needs to be attempted adoptingan integrated approach

3 .6 Protection

The sanctuary is protected from all sorts of illegal activities as per the Wildlife Protection Act 1972 with declaration of the water tank as sanctuary during 31.12.1998.

3.6.1 Legal Status

The sanctuary was created under section 26 A of Wildlife Protection Act 1972 as per G.O.No.379, Environment & Forest (FRV) Department, dt. 31.12.98. The total area of the sanctuary is 45.28.5 Ha. (Survey no: R.S.No.11/1 of Udayamarthandapuram village). The sanctuaries do not consist of any Reserve Forests.

3.6.2 Hunting

Hunting is prohibited inside the sanctuary as per the Wildlife (Protection) Act 1972.

3.6.3 Illegal Activities

Poaching inside sanctuary is totally stopped.. Local people sometimes try to catch fish from the tank during night hours for their domestic purpose.

3.6.4 Insect Pest Attacks and Pathological Problems

There has been no incidence of any insect attacks or pathological problems noticed in the sanctuary. Careful monitoring is being done to assess any pest attacks on vegetation.

3.7 Zonation

Integrated management planning is based on the principles of zoning which provide a basis for targeting interventions for achieving conservation and wise use of the bird sanctuary. The Ramsar framework for 'Wetland Inventory, Assessment and Monitoring', which is a multi scalar approach to wetland documentation, has been adopted for the purpose. This hierarchical approach comprises a progression in scale from river basin to individual wetland site/Agriculture fields, and should be consistent with the river basin approach adopted for management of Udayamarthandapuram Bird Sanctuary. Interconnectivity in management planning at different hierarchical scales ensures maintenance of ecological integrity of the wetland system. For the purpose of management planning the entire wetland area is proposed to be demarcated as a core zone and the adjoining wetlands and paddy fields which receive water from the lake and offer foraging site for the birds of Udayamarthandapuram Bird Sanctuary as buffer zone.

Land use within the core zone should be regulated as per the provisions laid under the GO 120 of the Environment, Forest Science and Technology. The order allows fishing with traditional methods, traditional agriculture without any chemical fertilizers and pesticides, use of ordinary boats for communication, right of way with existing roads connecting main habitations and their maintenance by creation of vents and right of maintenance of drainages to avoid water logging within the peripheral areas. The order categorically bans pisciculture and intensive agriculture within the sanctuary area. The buffer areas have an influence on the ecological characteristics of the core area, and therefore could be used for sustainable agriculture and aquaculture purposes.

However, for the implementation of the management zoning, the preconditions of sanctuary area declaration as laid down under the Wildlife (Protection) Act, 1972 have to be met and implemented. The plan summarises that necessary measures would be taken by the state government to address these issues and necessary legal and institutional basis is created for implementation of the management plan.

3.7.1 Core Zone

Entire wetland area is the core zone of the sanctuary

3.7.2 Buffer Zone

Adjoining wetlands and paddy fields which receive water from the lake and offer foraging site for the birds of Udayamarthandapuram Bird Sanctuary constitutes the buffer zone.

3.7.3 Tourism Zone

The sanctuary at present does not attract significant number of visitors primarily due to its isolated location from the main town, as also the absence of publicity. However with growing interest in Muthupet Mangroves located nearby to it, the number of visitors is slowly increasing every year. Due to large congregation of the endangered Openbill Storks and other wintering birds,the sanctuary could be developed into a major attraction to visitors.

Four watch towers are available for bird watching. The bunds are developed into a nature trail over distance of 2 kms for nature lovers. In addition to that toilet facilities have been developed for visitors. Presently there is facility for overnight halt in the sanctuary rest house.

3.7.4 Status and Issues

i. Core Zone: The entire core zone (Bird Area/WetLand) is intact without any disturbance to the eco system. Only habitat restoration and management interventions are being implemented by the forest department. The core zone is well protected by the frontline field staff by patrolling on foot to prevent any illegal activities within the tank.

ii. Buffer Zone: The agriculture fields in and around the bird sanctuary are acting as a buffer zone which is highly used by birds for foraging, resting and roosting activities. The fields are protected through proper awareness to the farmers about the significance of migratory birds to the sanctuary.

a) Demographic Details of the Landscape

The existing situation in the zone of influence: There are 72 hutments located inside the sanctuary. These are mostly encroachment along the road abutting the sanctuary. In the past local people had taken the area on lease for raising coconut. Though lease period has expired the people continued to occupy the area. It has been now decided to delete the human habitations from the sanctuary area. The local livestock comprises mostly of goats and cows that graze during the dry months when there is no water inside the sanctuary. The local human population comprise mostly of agriculturists and daily wage labourers. As paddy is the main crop around the sanctuary the people are dependent on water from the sanctuary tank for irrigating their agricultural fields. The dependency of the people on the resources of the sanctuary other than water is little. For maintenance of bird habitat, it is necessary to retain a minimum level of water in the tank during season. But in the drought years, when water is in short supply, the interests of the birds and local people come in conflict.

b) Infrastructure developments

The sufficient infra structure facilities to be developed in this wetland to attract the more numbers of visitors.

c) Cultural aspects of wetland use / landscape

There is no sites of cultural values in the vicinity of bird sanctuary, except religious temples (Muniesvarur kovil) often visited by local people.

iii. Eco- Tourism Zone

The basic understanding of the nature and functions of Wildlife Sanctuary for Species Conservation, Eco-system Services and sustained economic benefits is critical to management of sanctuary. Of late, Eco Tourism is catching up a significant role in conservation of biodiversity. Now it is lacking in many areas of critically important places such as bird habitats. The possible reasons are; poorly designed integrated ecological, economic and social dimensions in park management to achieve the goal of sustainable management policies. The proposed plan of eco tourism is based on evaluation of hydrological, ecological and socio economic features for Udayamarthandapuram Lake.Eco tourism is defined as "**a responsible travel to natural area that conserves the environment and improves the wellbeing of the local people**". Eco tourism calls for pragmatic scientific management of the protected areas without jeopardizing the wild life wealth and environment. It is essential for benefit of nature conservation, eco-awareness, eco education and enjoyment of people. This means that those who implement and to participate eco-tourism activities should follow the following principles:

1. Environmental and cultural awareness and respect
2. Positive experience for all visitors and hosts,
3. Provide direct financial benefit for conservation and
4. Financial benefit and improvement for local people.

Scope: The concept of eco tourism is proposed as part of conservation and awareness strategy for Udayamarthandapuram Bird Sanctuary. The module is planned to protectmigratory bird species and their habitats. With the implementation of eco tourism, the integrity of lakebio-diversity is maintained through the participation of various stakeholders of tourists with the support from the District and Forest Administration. It is realized that development of basic logistic facilities for visitors could also play a fundamental role in the management of UBS by promoting eco tourism for various target tourists. This could benefit different tourist's stakeholders to provide comforts to enjoy wilderness of the bird sanctuary by availing different eco friendly packages offered to them by the eco tourism activity. Now, the District Administration has targeted to assist the forest authorities in taking up works related to eco-friendly activities based on site specific resources and other cultural values.

Eco Tourism Committee (ETC) is proposed as part of conservation and protection strategy for the Udayamarthandapuram Bird Sanctuary. The tourism activity has been planned to protect various endangered bird species and their habitats besides biodiversity of the bird sanctuary. With the implementation of ETC, the integrity of lake is maintained through the participation of local communities along with the support from the forest department. It has been now realized that the local communities could also play a fundamental role in the management of national parks and sanctuaries by promoting eco tourism for various target tourists. This could also benefit different tourist's stakeholders to provide comforts to enjoy wilderness by availing different eco friendly packages offered to them by the eco tourism schemes. Further, the sanctuary management policy has been targeted to encourage the local communities in taking up responsibilities to launch various eco friendly activities based on site specific resources and other cultural values. In this context, the Udayamarthandapuram Bird Sanctuary has the potentiality for initiating ETC because of rich biodiversity in terms of migratory birds. Further, this site is famous for its unique bird diversity during wintering period from October to February. With all these ecological values, the sanctuary area has been chosen for the implementation of ETC for the benefit of forest wealth and visitors in the

Water augmentation is a critical management intervention for the bird habitats

long run. Such a mechanism could promote the people's attitudes to bring out an ecological balance to the natural resources of the Udayamarthandapuram Bird Sanctuary. If the present style of tourism is transformed into **"Community Eco Tourism**", it could simultaneously benefit the local communities and the forest management for its various management policies. Ecotourism is defined as "*responsible travel to natural areas that conserves the environment and improves the well-being of local communities*". Such tourism is low impact, educational, and protects the environment, while directly benefiting the economic growth of the local communities". It is more realistic to implement the concept of eco tourism to develop a strong mechanism of reducing the biotic pressure on the fragile lake ecosystem of the sanctuary which comprises of a variety of ethnic, historical, religious and natural resources.

Profile of the Eco Tourism Site

1)	Name of the District.	:	Tiruvarur
2)	Name of the Circle.	:	Trichirappalli
3)	Name of the Division.	:	Tiruvarur
4)	Name of the Range	:	Mannargudi

Eco Tourism Activities: Udayamarthandapuram

The Eco tourism activities of the bird sanctuary should be addressed in three folds of conservation values and those are relevant to the bird sanctuary as part of strategy towards sustainable tourism schemes for the sanctuary

1. Water management in the lake,

2. Ensuring Biodiversity Conservation Initiatives and

3. Socio Economic Livelihood Activities of the Local Communities

The above components have to be focused to plan for a comprehensive and an integrated eco tourism plan for the Udayamarthandapuram Bird Sanctuary, with a long term perspective and sustainability.

Ecological benefit of the Eco Tourism in Udayamarthandapuram Bird Sanctuary

a) Enrich the biodiversity value of the Lake with the development of eco tourism
b) Promoting Conservation and awareness among the concept of eco tourism
c) Attract various target visitors from different regions of the state
d) Alternate suitable biological site for wintering birds besides Point Calimere WL and Bird Sanctuary
e) Benefit the local communities in livelihood improvement and
f) Finally overall improvement of habitat improvement for birds and people

Eco friendly activities for Udayamarthandapuram Bird Sanctuary have to be proposing through District Administration to develop viable eco tourism to the Bird Sanctuary, in a sustainable manner. Such a scheme could also encourage the local communities to co- operate with the forest department in managing the wealth and biodiversity of the Udayamarthandapuram for conservation of migratory birds. Therefore, necessary proposal for developing eco-tourism with various activities have to be justified along with its ecological values to the birds and also promoting human values. The eco-tourism schemes for the sanctuary by the support and Assistant of District Administration will be a model for a co-operative effort in conservation of migratory birds to the Lake of Udayamarthandapuram as well as other parts of the state

a) Existing Facilities

The following facilities are available for the tourists in the sanctuary area. The facilities are bare minimum and require more face light for the proposed eco tourism.

a) Bird Walk Area

b) Watch towers to sight birds

c) One Rest House for tourists

d) Trekking routes

b) Focus: Policies

The eco-tourism should be focused wit**h t**he involvement of various line agencies such as District Administration, Tourism Department, Agriculture Department, Local Panchayat and Fisheries.

3.8 Research, Monitoring and Training

As there is no field Research Assistant, no research is being carried out in the sanctuary either long term or short term research. However, permission is accorded to willing scientists, colleges and research institutions for carrying out research on water birds. Census of water bird is being conducted as per fund resource availability. The practice of daily count of water bird during migratory season has been introduced since September 2000.

3.8.1 Research

Long term research/short term investigation/management researches are to be encouraged in the sanctuary area for the benefit of conservation programme of migratory birds.

3.8.2 Monitoring

Wetland monitoring systems should build upon the information provided in wetland inventory and assessment activities. Specific monitoring should be based on a hypothesis derived from the assessment data and be contained within a suitable management structure. Predicted impacts on biodiversity should be monitored, as should the effectiveness of mitigation measures proposed in the environmental impact assessment. Proper environmental management should ensure that anticipated impacts are maintained within predicted levels, that unanticipated impacts are managed before they become a problem, and that the expected benefits are achieved as the project proceeds. The results of monitoring provide information for periodic review and

alteration of environmental management plans, and for optimising environmental protection through good practice at all stages of the project.

3.8.3 Human Resources Development - Training

Capacity building to the front line field staff is critical to the successful management of water birds and their habitats. This can be achieved through conducting periodical training programmes with suitable infrastructure development.

Expertise and opportunities for training in water bird assessment, monitoring, research and migration exist within the country, with institutions such as Bombay Natural History Society (BNHS) - Mumbai, Salim Ali Centre for Ornithology and Natural History (SACON) - Coimbatore, Wetlands International - New Delhi, and Wildlife Institute of India (WII) - Dehra Dun. Periodic training programmes should be held for various target groups including field staff managers and decision makers, local NGOs and community groups. The training should be provided on methods to collect information on approaches to bird census, analysis of information developing monitoring protocols and interpretation of data for use at various levels. A cadre of trained technical staff should be developed for trend analysis of water bird populations in relation to habitat features. Specific training programmes should be developed in collaboration with BNHS for assessment of bird migration and understanding the constraints in the pathways. A protocol for water bird census should employ the scientific methodology emphasizing on visual census, line transect method, counting nests in colonies and block methods. Surveillance of water birds for avian influenza and other zoometric diseases should employ scientific methodology and techniques as promoted by FAO.

3.9 Administrative Setup

The sanctuary is under the administrative control of the District Forest Officer, Tiruvarur and falls under the jurisdiction of Trichy Circle. The field staffs for the sanctuary consists of a Forester, Forest Guard, Reserve Watcher and Anti-Poaching Watchers.

3.10 Communication

Communication facilities are not available in the sanctuary. The field staff using their mobile phones for field works. It is hence absolutely imperative that communication facilities are improved upon for the effective management of the sanctuary.

CHAPTER – IV

Development Programs and Conservation issues

4.1 SWOT Analysis

4.1.1 Strength

Udayamarthandapuram Bird Sanctuary is a small water tank (48.285ha) and hence it is possible to implement various management initiatives and implement them in a successful manner to maintain the habitat integrity to wintering birds.

4.1.2 Weaknesses

Lack of effective local level institutional mechanism to coordinate activities at various levels within the state government for conservation and development of Udayamarthandapuram Lake is the major reason for degradation of the lake environment.

4.1.3 Opportunities

Only a few villages bordering the sanctuary and hence it is feasible to protect and manage the sanctuary along with its biodiversity in the long run.

4.1.4 Threats

Migratory water birds are the main wildlife of the sanctuary. Their visit to the sanctuary depends upon the availability of water in the tank. The receipt of water and its quantum depends on release from Mettur Dam and northeast monsoons. Often delayed release of water or release of inadequate quantum, will affect bird arrival to the sanctuary. When water in the sanctuary tank is not sufficient, the water birds visit nearby agricultural fields for feeding. Such birds are then vulnerable for poaching by the local people.

The most serious threat to the water birds is encroachment of the tank bed by a variety of weeds and reeds and siltation of the tank bed. Nearly half the sanctuary is now under weed encroachment. This has greatly reduced the available water spread area for the water birds. As a result, arrival of teals and ducks is going down every year. New weed removal is undertaken to improve the water holding capacity of the tank. Weed removal and de-silting are the two most important management activity necessary for improving the bird habitat.

For ideal maintenance of the bird habitat, presence of water in the tank is required for at least eight months in a year. But this may not be always possible as availability of water in the tank depends upon release from Mettur dam and regularity of northeast monsoons. It is also necessary to retain a minimum level of water in the tank during season. But in the drought years, when water is in short supply, the interests of the birds and local people come in conflict.

Paucity of funds is another handicap for sustained efforts of bird conservation. Most of the developmental activities are being carried out under centrally sponsored schemes.

The services of a qualified field Research Assistant is essential for conducting field studies on sanctuary wildlife. Field study being technical and academic in nature is mostly beyond the capability of regular field staff. Though Wildlife Wardens may be qualified it cannot be expected of them to attend such studies on a regular basis. Absence of a regular field Research Assistant has been a serious handicap for most wildlife sanctuaries.

There is no serious threat from development activities and also from other biotic interferences from local communities. Grazing by livestock in the tank is not a major threat to the eco system. Only the invasion of alien plant species is the threat **to** the bird habitat which is slowly removed by the forest authorities as partof strengthening eco system.

4.1.5 Critical Review and Result of Past Intervention

The sanctuary was relatively unknown till 1988 as absence of perching tress and mounds did not attract many birds. *Acacia nilotica* plantations were raised by Social Forestry Wing during 1985 and 1986 and these trees covered a great part of the bird sanctuary in the past. These trees have attracted more birds. Strangely enough, the trees started dying soon after and only those on the bund remain with alive. Some are of the opinion that the *Acacia nilotica* trees had died due to heavy deposit of guana from water birds. If this is true, it points to the huge number of birds that might have visited the sanctuary in the past. The local watcher, who has been associated with the Udayamarthandapuram sanctuary for more than 10 years had informed that the number of bird arrival to the sanctuary is actually on the increasing trend particularly that of the Open bill storks. Going by his information, it appears that as the sanctuary started silting up the number of teals, ducks and other dabbling species had gone down while population of Open bill Storks has gone up as the shallower water favouring easy foraging of snails, their main diet. The number of Open bill storks in the sanctuary goes up to 5000 during January –February.

The history of raising mounds inside the sanctuary goes back to 1991 when 320 Inca dulce saplings were planted on mounds on the western part of the sanctuary. The planting was carried out as a part of encroachment eviction drive as the local people were trying to occupy the said area. Subsequently, large earthen mounds were raised inside the sanctuary and had been planted mostly with Inca dulce trees. *Acacias* were perhaps not initially planted keeping in view its poor field survival in the past. Most of the mounds are located on the southern and western part of the sanctuary. The trees however were not favoured by the birds for a long time. It was presumed that the trees were not utilized for perching by the water birds as the branches would not support their weight. It was later realized that the birds were not used to perching on such trees as they were used to only Acacia in other parts of the country. However, as time

progressed the birds started utilizing the trees and in the last two years it has been observed that Inca dulce trees are being used heavily by Open bill Storks.

4.1.6 Challenges and Way forward

The key challenges as part of improving the management strategy of the Udayamarthandapuram Bird Sanctuary are as follows

1. Retention of a minimum water level for the entire year for which regular deepening is necessary and silt should be transported away from the Sanctuary. The disposal of silt may be fixed with co-ordination of District administration.
2. Proper management and maintenance of the feeder channel
3. Enhancement of native aquatic vegetation.
4. Delineation of zones and distribution of bird species in relation to resource availability
5. Conservation of wildlife sanctuary and providing economic incentives to the stakeholders through sustainable resource development.
6. Enhancing water holding capacity through removal of weeds and selective dredging.

PART –II

CHAPTER –V

Vision, Objectives, Issues and Problems

5.1 Vision

Protection, restoration and conservation of wetlands for the cause of biodiversity conservation and human well being.

5.2 Mission

To restore, develop and manage the Udayamarthandapuram Bird Sanctuary as a critical breeding habitat for the large wetland birds of India, while also providing opportunities for local people, naturalists and visitors from other parts of the state and country, to appreciate and learn about nature and its components.

5.3 Objectives of Management

A strategic objective is a broadly defined objective that an institution or an organization, such as the Tamilnadu Forest Department, must achieve in order to fulfill the defined vision and mission. The following are the strategic objectives of the Wetland Action Plan for Udayamarthandapuram Bird Sanctuary.

- To undertake an ecological, social and interface assessment of the Udayamarthandapuram Bird Sanctuary and its environs.
- To effectively utilise the results of the assessment in defining the technical components of the action plan.
- To formulate the strategies and actions for the identified technical components; and
- To develop Udayamarthandapuram Bird Sanctuary as a public space for constructively engaging with the stakeholders.

5.4 Problems and Issues: Solutions

Migratory water birds constitute the major wildlife of the sanctuary. Their visit to the sanctuary depends upon the availability of water in the tank. The receipt of water and quantum depend on release from Mettur Dam and Northeast Monsoons. Often delayed release of water or release of inadequate quantity will affect bird arrival in the sanctuary which is major problem. When water in the sanctuary tank is not sufficient, the water birds visit nearby agricultural fields for feeding. Such birds are then vulnerable to poaching by local people. The most serious threat to the water birds is encroachment of the tank bed by a variety of alien plant species. Nearly half the sanctuary is now under weed encroachment. This has greatly affects water availability in the spread area for the water birds. As a result, arrival of teals and ducks is coming down every year. If encroachment goes unchecked, bird arrival is likely to drop further in the coming years.

A variety of habitat restoration and management interventions has been envisaged as part of removing the prevailing threats to the sanctuary and also enrich the habitat diversity.

Management Intervention

Sl. No	Activities	Expected Outcomes
I.	**Strengthening the Boundries**	
1.	Construction of Protection wall alround the sanctuary boundary	Prevent the entry of trespassers and poachers, encroachment, illegal fishing, soild waste dumping and other threats to the wetland. In total, an intact boundary is established.
2.	Prividing revetment arrangements in the boundries of the sanctuary	
3.	Engaging Anti - poaching watchers round the year @ 7 Nos per month for 5 years	Through check in hunting in the sanctuary area and in areas that augment migratory birds thereby leading to increase in number of migratory visitors.
4.	Deepening and strengthening the existing sanctuary boundries and formation of mud flat islands using the excavated earth at the lake dependent birds and for planting aviphilic trees over them	Increase in resting grounds for birds favours foraging, favours tourist attraction. In a long run, the transitory resting site shall get transformed into a breeding ground.
5.	Eradication of unwanted exotic weeds in the lake	This favours indigenous aquatic vegetation and the aquafauna dependent on it. Reduction in weed growth results in increase in dissolved oxygen, favouring fish life, reduction in release of toxic exudates, improved change in water taste, colour and odour making water potable, reduction in phytotoxicity, reduction in pathogen load, eutrophication.

	Awareness Creation & Capacity Building	
6.	Erection of signages	• Increase the responsibility of the tourists. • Regularisation in tourist flow and resource use. • Equipment of frontline staff in bird identification and documentation. • Detailed database on bird species abundance and population. • The above database can help to upgrade the status of the sanctuary into a Ramsar site.
7.	Eco-bird voice along the natural trial	
8.	Display boards of critically endangered birds	
9.	Conducting Eco-Camps to students Public	
10.	Capacity Building Training programme for field staff / line department agencies / ETC/ EDC members	
11.	Printing publicity materials of stickers pamphlets etc	
12.	Conducting Bird Census	
	Eco-Tourism & Infrastructure Development	
13.	Construction of Watch Tower and Improvement of existing Watch Tower	• The Infrastructure creation focuses on promoting eco-tourism. • Increase in tourist flow to Udhayamarthandapuram. • Regulating tourist movement in the sanctuary area thereby minimizing disturbance and maximizing resting time (this favour foraging and breeding)
14.	Construction of Anti-Poaching shed	
16.	Improvement of existing entrance	
17.	Maintenance of existing buildings	
18.	Providing drinking water facilities to the tourist	
19.	Purchase of binoculars for viewing water birds	

20.	Providing current consumption LED lamps	
21.	Providing paver block path way arrangements	
22.	Establisgment of wooden eco-sheds	
23.	Providing dust pins	
24.	Clearing the natural trial	
	Research and Development	
25.	Engaging an Eco-Guide	The research outcomes are aimed at increasing knowledge on the wetland and its bio-diversity primarily to dreive management interventions. The knowledge on weed inflow, spread, invasiveness, water inflow and outflow, moisture gradient change, siltation, source streams management shall increase. Only this can prevent ecological degradation of the wetland.
26.	Engaging a wetland consultant cum wildlife biologist for 5 years	

CHAPTER – VI

Future Strategies

6.1 Strategies

The management strategy of the Udayamarthandapuram Bird Sanctuary is revolved around sustainable development of bird habitats with integrated planning for management at the river basin, recognizing the inter-connections of the sanctuary with its catchments and river system. In addition to conservation of water birds, the major purpose is to establish the effective management practices for restoration of wetland for the ecological and economic security to the people dependent upon the wetland area for their livelihoods.

The broad approach adopted for formulation of management action plan of the sanctuary includes following:

1. Participatory approaches involving local communities, scientists, NGOs and concerned organizations to ensure sustainability of activities.
2. Revival of indigenous knowledge and traditional practices which are cost effective for management of biodiversity
3. Application of science based techniques for restoration through research and development activities.
4. Periodic monitoring and evaluation with focus on achieving the goals and objectives rather than merely activities.
5. The critical problems confronting Udayamarthandapuram Wildlife Sanctuary were thoroughly analyzed to develop rationale for the management objectives. The targets under each management objectives were quantitatively defined based on rapid field survey, information review and community consultation. The strategies proposed for management are based on good management practices adopted elsewhere and traditional knowledge.

6. The full integrated management plan (IMP) broadly focuses on biodiversity conservation and maintaining ecological processes and functions through land and water management.
7. Sustainable resource development is proposed to be achieved through conservation compatible fisheries and agriculture development.
8. Micro-enterprises involving value additions would provide additional / alternate income generation to the stakeholders.
9. Special emphasis has been laid on low impact ecotourism development as an important tool for awareness generation on wetland values and functions and having potential of providing livelihood support to the stakeholders. Institutional development and community Participation are envisaged as cross cutting components to achieve sustainable development of wetlands.

6.2 Harmonization

There is no issue of conflict mechanism prevails now as part of sanctuary management with the influence of local communities. The conservation strategy and sustainable resource utilization of Udayamarthandapuram is largely aimed for ecological safety and economic improvement of stakeholders living adjoining the sanctuary. The purpose is to establish effective management practices for restoration of Bird Sanctuary with overall wetland conservation and providing economic incentives to the stakeholder through coordinated actions at basin level linking Agriculture. Thus there is no issue of conflicts and there is an evident trend of ecological harmonization exits in the sanctuary.

6.3 Management of Admitted Rights

There is no right of claim for any type of activities. The villagers are permitted to visit the pilgrim centers during the festival period. However, the extent of people visiting the temple is low. No campaigning is permitted with the bird sanctuary for any type of activity. Only tourists are allowed to sight birds. Research activities on management oriented subjects are promoted with necessary permission from the Chief Wildlife Warden.

6.4 Human Disturbances, its Effects and Management

Migratory water birds are the main wildlife of the sanctuary. Their visit to the sanctuary depends upon the availability of water in the tank. Often delayed release of water or release of inadequate quantity will affect bird arrival in the sanctuary. When water in the sanctuary tank is not sufficient, the water birds visit nearby agricultural fields for feeding. Such birds are then vulnerable for poaching by the local people. The most serious threat to the water birds is encroachment of the tank bed by a variety of weeds and reeds. Nearly half the sanctuary is now under weed encroachment. This has greatly reduced the available water spread area for the water birds. If encroachment goes unchecked, bird arrival is likely to drop in the coming years.

As part of management interventions, the following conservation oriented habitat restoration activities are attempted.

a) Improvement of aquatic habitats with plantation of native species suitable to wet land
b) Removal of alien plant species
c) Improvement of water holding capacity by construction of smaller bunds

6.5 Strategies for Water Level Manipulation and Control

Environmental Flow Assessment of Udayamarthandapuram Lake for identification of optimal water allocation scenarios for human needs (agriculture,) considering ecosystem requirements (maintenance of biodiversity, ecosystem and wintering birds). Environmental flows are defined as a water regime provided within the river longitudinally and wetland regimes laterally within the floodplains and their benefits where there are competing water uses and where flows are regulated. The water regime includes consideration of the values, timing and quality of flows including periods of low or no flow and floods for river systems the floodplain and estuary should be included in environmental flow consideration. Environmental flows have become increasingly widely accepted as an important component for integrated water resources management while environmental flows are intended to sustain the goods and services that aquatic ecosystem is provide, in many cases water use is in conflict with environmental water requirements, and hence providing environmental flows requires careful consultation, negotiation and ultimately often compromise by one or more water sector. Ramsar Convention on Wetlands has adopted a resolution containing "guidelines for the allocation and management of water for maintaining the ecological functions of wetlands". India being signatory to the Ramsar and Udayamarthandapuram being a potential Ramsar site (based on the eligible criteria required for the designation as a Ramsar site) this resolution is particularly relevant.

Chapter_VII

Protection Plan

7.1 Birds

The Udayamarthandapuram Bird Habitat is protected with different management protocols for conservation of lake along with its biodiversity.

1. Strengthening protection for birds in and around the Sanctuary
2. Establishment of a conservation reserve/bird sanctuary to extend to areas of the lake not covered by the current boundaries
3. Networking with State and National Government and Non-Government Agencies and Institutions to implement cooperative and collaborative actions for management of bird areas with scientific conservation initiatives.
4. Involvement in activities to implement priorities of International Treaties (including CAF Action Plan, CMS, Ramsar, CBD).
5. Involvement of local communities in water bird and habitat conservation programme
6. Establish a long-term monitoring programme for migratory birds.
7. Establish a bird migration study programme for breeding and migratory water birds, in collaboration with local and international expertise.
8. Establish Bird Health Surveillance and Monitoring Programme for breeding and migratory water birds, in collaboration with local and international expertise.

7.2 Habitat

The bird habitat is restored with a variety of management interventions in order to maintain the integrity of habitats for the bird species in the long run. The following are the suggested steps as part of habitat improvement in the sanctuary.

a) Enhancement of native vegetation as a resource base for water birds
b) Maintenance of open water areas and proportionate emergent vegetation diversity to respond to the wide diversity of feeding and nesting habitats required by different bird species.

Biological Indicators with habitat improvement

1. Abundance of food and shelter plants.
2. Increase in density and population of benthic fauna
3. Enhancement of fish dependent water bird populations.

Strategies for bird habitat

a) Maintaining connectivity of existing bird sanctuaries and other wetlands in the Udayamarthandapuram Lake and surrounding wetlands
b) Restoration of encroached land (if any) to enhance area of water bird habitats.
c) Reduce the prolific growth of exotic (non-native) aquatic plant species: Coverage of *Prosopis chilensis, Eichhornia crassipes* and other species is reduced
d) Mitigate proliferation of introduced invasive fish species eg Tilapia species.
e) Control of *Prosopis chilensis, Eichhornia crassipes, Ipomea carne*a and other species to provide additional water holding capacity and enhancement water depth and water spread area
f) Development of micro enterprise based on manufacturing of handicrafts through processing of the invasive plant species. The enterprise would also be a viable alternative for income generation and at the same time would contribute to management of invasive plant species

7.3 Watershed

The water management of the sanctuary is attempted with following specifications:

a. Rejuvenation of hydrological functions of Udayamarthandapuram lake through 23% enhancement to present water holding capacity and circulation and mixing patterns within the lake
b. Reduce water logging by 60% in areas around Udayamarthandapuram sanctuary by enhancing water holding capacity and reducing impediments to water flows.
c. Water quality of Udayamarthandapuram improved to B category as per CPCB designated best use criteria through management of sewage and sewerage from adjoining settlements and water quality regulations
d. Allocation of water for human and ecological purposes through formulation and operationalization of stakeholder endorsed water management plan.

CHAPTER – VIII

Management Intervention

8.1 Conservation and Restoration of Degraded Habitat

Habitat restoration activity is focused with active management issues based on existing activities of the Udhayamarthandapuram Bird Sanctuary which primarily includes land and water management, biodiversity conservation, and socio-economic aspects. The key issues will be identified based on gaps in the existing management practices and key issues emerging out of hydrological processes and changes in biodiversity. The human interventions and people's participatory programme are being considered for execution of habitat restoration as mentioned below:

1. Development of Feeder Channel
2. Periodical De-silting
3. Monitoring of Aquatic Vegetation
4. Delineation of Zones and Distribution of Bird Species in relation to critical areas
5. Inter linkages of Hydrological processes and Biodiversity Conservation Issues
6. Conservation Strategies of Bird Sanctuary and Providing Economic Incentives to Stakeholders through sustainable resource development of the Sanctuary.
7. Enhancing water holding capacity through removal of alien plant weeds

Management of Drainage System

There is no perennial water source in the sanctuary. The sanctuary is an irrigation tank used for storing water for agriculture. It receives water from Mettur Dam from August till January.

a. Improvement of Hydrological Regimes

Water inflows and outflows to the lake should be estimated with the help of hydrological experts. Comparison of Satellite imageries of 8-10 years back of Udhayamarthandapuram basin with the existing imageries to understand the changes in the land use pattern and crop pattern could help us to develop action plan on hydrological regimes.

b. Developmental Activities

Theimpact ofagriculture in and around the bird sanctuary should be evaluated.

c. Institutional Support

Forests, Horticulture, Soil Conservation, Environment and Remote Sensing, Science and Technology, Agriculture, Fisheries, Public Health Engineering, Rural Development, Khadi and Village industries, Tourism, and Revenue are involved in various developmental activities of the Udhayamarthandapuram Lake. The main activities of these institutions relate to implementation of various programmes for land and water management, socio-economic development and conservation of natural resources. This institutional mechanism has to be evaluated with periodical workshops and awareness camps for them.

Existing tourist's facilities at the sanctuary

Restoration of Breeding Habitats

Nesting bird habitats/ site specific locations in the sanctuary are:

i. Marshes where floating nests are built in floating vegetation
ii. Reed beds and tall grasses
iii. Trees and bushes
iv. On the ground around streams

These areas are used by 45 species of birds. The food habits and feeding styles of these breeding species depend on a variety of aquatic vegetation (including seeds, stems, leaves, and corms), aquatic and terrestrial insects and their larvae, small to large sized fish, amphibians, molluscs and slugs, crustacean, worms and even rodents. Proper habitat modifications techniques are needed to the above nesting sites with suitable habitat matrix for the species.

The restoration of the lake would result in suitable environmental conditions, which will provide better habitats for water birds to exploit the resources. This provides an important opportunity for systematic studies through regular monitoring of entire lake system. Such a study will also provide the basis for updating of management actions in relation to water level controls, management of areas for different vegetation types and cover regimes, prey abundance

Biodiversity

Habitat Restoration

The following aspects to be improved as part of habitat restoration

a) Improved knowledge of year-round habitat requirements of birds, especially migratory and breeding water birds in the Udhayamarthandapuram Bird Sanctuary and surrounding wetlands and conservation priorities.

b) Increased carrying capacity of the Udhayamarthandapuram Bird Sanctuary and surrounding wetlands for birds, especially migratory and breeding water birds.
c) Improved knowledge of migration strategies, precise international and national migration routes (including breeding, staging and non-breeding sites) and linkages of water birds using the Udhayamarthandapuram Bird Sanctuary and surrounding wetlands.
d) Control of poaching through strengthening existing network of protected areas
e) Establishment of a bird sanctuary/conservation area in unprotected areas of the Lake
f) Involvement of local communities through formation of bird protection committees
g) Improved understanding of the health of birds (particularly of zoonotic diseases, which have the potential for transmission to people).

With the implementation of habitat restoration the following habitat indicators would be visible in the bird sanctuary

Visible Habitat Indicators with the implementation of habitat restoration schemes

1. Water bird species (Diversity and Abundance) are improved
2. Populations of threatened and vulnerable species are protected
3. Populations of all breeding water bird species is increased through improvement of breeding habitats with suitable habitat conditions
4. Information on migration strategies and precise routes of major long distance migrant and local migrant water bird species is available
5. Long term water bird population monitoring information is available
6. Long term surveillance information on the health of birds (particularly zoonotic diseases) is available.

Invasive Species: Habitat Restoration Strategies

a. Control of *Prosopis chilensis, Eichhornia crassipes, Ipomea carne*a and other species to provide additional water holding capacity and enhancement water depth and water spread area
b. Development of micro enterprise based on manufacturing of handicrafts through processing of the invasive plant species. The technology for using natural fiber for manufacturing of handicrafts is available through several organizations (for example, Kottapuram Integrated Development Society,) the enterprise would also be a viable alternative for income generation, and at the same time would contribute to management of invasive plant species.
c. Integrated control measures using mechanical and biological methods may also be attempted

Habitat Improvement: The following activities are suggested for habitat improvement

1. Creation of earthen mounds and planting them with suitable perching trees.
2. *Acacia nilotica* plantations can be raised on northern boundary for the benefit of birds.
3. Annual removal of *Ipomea* and other weeds to be carried out for creating more water spread area for birds.
4. De-silting of the tank needs to be carried out on a priority basis. The tank depth needs to be increased by a meter. This shall retain more water for birds as well as for agriculture. The de-silted soil should be removed outside the sanctuary area. For removal of the de-silted soil necessary permission may be obtain from the District administration.
5. Sanctuary bund needs to be repaired and strengthened. Defecation on the bunds by the local people has to be discouraged.
6. Creation of smaller ponds of 50mx50m size to store water during summer season.
7. Purchase of boats for management of water spread area and monitoring

8.2 Management of Eutrophication, Water Quality, Pesticides and other Chemical

The Lake had an excessive growth of invasive species often forming dense mats, the most common being *Ipomea aquatica, Eichhornia crassipes, Salviniasuriculata, Ottelia alismoies,* etc. Prolific growth of vegetation in the lake is primarily attributed to high concentrations of inorganic nutrients present in the lake waters, entering the lake in the form of agricultural run-off through various deltaic drains and channels. Thus water quality turns to be more of eutrophication with the influence of usage of chemicals and pesticides in the agriculture fields and the runoff water accumulate these substances into the lake. Such a process of change in the water quality might affect the food resources to bird species.

8.3 Direct Intervention

The practice of management issues with direct intervention is attempted in the below mentioned ways to improve the habitat quality of bird habitats

1. Managment of water regimes
2. Habitat restoration activities
3. Biodiversity improvement
4. Socio economic development of local communities adjoining the bird habitats

8.4 Intervention to Improve Availability of all forms of food

Management intervention is tailored to improve the bird habitats to enrich food resources in the lake for migratory birds. The following are major steps to achieve the increasing trend of food availability in the lake.

a. Propose measures for management of aquatic vegetation and control of invasive species to bring more diversity of insects and fish fauna into the lake ecosystem

b. Propose measures for enhancing diversity of fish and other aquatic species with proper protection of lake
c. Assess threats to water birds due to habitat modifications including water level changes and vegetation characteristics and minimize the threats to improve all forms of food items to migratory birds
d. Develop monitoring mechanisms and research areas for assessment of migratory and residential water bird populations

8.5 Management techniques for conservation and protection of bird habitats

Management efforts are largely focused on the following components:

1. Habitat restoration to bring a better habitat quality in aquatic habitats that supports wintering birds
2. Water augmentation in the tank for creating suitable critical areas for bird species
3. Protection of water tank to maintain adequate food resources to birds
4. Provide provision for roosting of birds by altering vegetation growth in densely covered areas
5. Plantation in bunds for bird's shelter in the tank

Protection measures those are adopted to protect the bird sanctuary against encroachment is the highest priority as part of protection of bird habitats. The existing field personnel of the sanctuary consist of one Forester, Forest Guard, and Anti-poaching watchers. While posting field staff in the field care has to be taken to ensure persons with inclination to work in wildlife divisions. The traditional bird trappers are bring into a mechanism of awareness programme and nearby villages should be concentrated for this exercise. Adequate protection should be provided by front line staff to control the poaching outside the sanctuary. The following activities are suggested for protection.

1. Creation / redeployment of one more Forest Watchers to strengthen the protection with Forest Guard
2. Construction of residential quarters for field staff
3. Engaging protection watchers for anti-poaching activities
4. Identification of vulnerable areas outside the sanctuary for poaching incidences.
5. Identification of nearby water bodies and wetlands which supports the bird population in and around the sanctuary.
6. Engaging protection watchers for strengthening the protection of birds in vulnerable areas outside the sanctuary and water bodies
7. Providing communication equipments as part of strengthening protection.

8.6 Management of Water catchment areas and the channels

Feeder Channel Maintenance

Develop action plan for treatment of feeder channel for soil erosion and sedimentation control and flow regulations through limited engineering and other appropriate (manual) measures.

Water Management

The water management in the park is ensured with a careful evaluation as mentioned below to attract bird species diversity and abundance in the lake:

i. Assessment of current water use and identification of conflicting interests
ii. Propose measures for enhancement of water holding capacity using ecologically sustainable interventions
iii. Develop action plan for rejuvenation for wetland and optimize water regimes
iv. Develop framework for water management considering human and ecological demands
v. Assess current threats to biodiversity due to changes in hydrological regimes, pollution and other anthropogenic pressures

8.7 Management of Seasonal Flooded Areas

The influx of more water into the bird sanctuary from the nearby channels and agriculture fields with the impact of seasonal flood is being regulated through a outlet mechanism being maintained by thePWD. More over there was no seasonal flood has been witnessed in the lake with the influence of water from Mettur Dam and also rain from depression in Bay of Bengal.

8.8 Removal of Invasive Species

The exotic species like *Eichhornia crassipes, Salvinia auriculata, Pistia stratiotes, Lemna minor, Wolffia sps.* And*Azolla pinnata* often form thick mats in different areas of the lake and thus alter the native vegetation. These species have reached a statusand thereby affect the overall composition of aquatic plants in many areas. Water Hyacinth and *Ipomea carnea* are the two invasive weeds replacing the native macrophytes, the major attractants to the migratory and resident ducks. The rapid expansion of these species would ultimately affect the biodiversity of the Lake including birds and ultimately affect larger heronry species for nesting and facilitate the free movement for the swimming birds. Therefore, it is recommended to thin the lower and inner branches of Acacia *nilotica* trees where ever distributed.

8.9 Grazing Management

Livestock grazing takes place during the summer months from April to August when the tank remains dry for three to four months. Impact of grazing is not a serious problem for the sanctuary as there no birds in the sanctuary during grazing period by livestock. As food preferences for cattle and birds are different, grazing is not much of a threat to the visiting migratory birds. However, the grazing of cattle could pose a serious threat to the plantation on mounds and bunds besides spreading off contagious diseases.

The sanctuary authorities deploy the anti poaching watchers regularly to driven the cattle from the lake during the dry season. However, grazing in the tank is banned during the winter period when the birds arrive in large numbers.

It is also planned to make a physical barrier surrounding the bird area to prevent cattle invade into the sanctuary. A mutual reciprocal agreement between villagers and forest authorities will be prepared as part of grazing management. It is also necessary to conduct a field investigation about the merits and demerits of impact of cattle on the dynamics of Udhayamarthandapuram Bird Sanctuary.

8.10 Strategies for Holistic Approach to Integrated Management of the Watershed

An evaluation of the current water use pattern within the Udhayamarthandapuram Bird Sanctuary and Habitats highlights the following:

a. Domination of water use by agriculture purpose
b. At present there is no mechanism in place to assess sustainability of the water use pattern and integration of ecological requirements for both local people and lake.
c. Increasing intensification of water use in agriculture due to changes in cropping pattern and increase in irrigated area in and around the bird habitats

The traditional rain-fed crop varieties have been replaced by high yielding with water intensive seed varieties since 1970s. The land use of the basin is dominated by agriculture, which accounts for 90% of the land use. The lake basin has a semi arid climate, with three seasons, namely summer, rainy and winter. Rainfall is received from the southwest as well as northeast monsoon.

Temperature ranges between a low of 20^0C in winter to above 40^0C during peak summer. The average rainfall is 1200 mm within the lake area,. Failure or delayed monsoon can lead to drought like situations in the Lake and its environment. Depressions in the Bay of Bengal are common and are generally experienced between

October and January can cause heavy rain. Fresh alluvium soil is being deposited every year by irrigation water received from Mettur dam. The basin is highly populated, and is inhabited by high density of people.

8.11 Eco-Development Activities

The policy of Eco-Development is catching up as an alternative strategy for Forest Protection and Conservation, involving local communities in the management of the Protected Areas (especially Buffer Zones). It is being implemented for a few villages adjoining the bird sanctuary by making local level adjustments imperative for matching ground level situation and bird diversity.

Objectives: The Eco-development objectives of the sanctuary have been designed in line with the general theme that helps effective conservation of the forests through the economic development of the sanctuary which locals depend by adopting an active strategy evolved through micro-planning. Ecological development has to be achieved by adopting a strategy where the bird habitat villagers have zero dependency and resultant impact on the bio-diversity of the Udhayamarthandapuram Bird Sanctuary.

All the uncovered villages within a distance of 3 kms from the sanctuary boundary must be incorporated into the eco-development programme. The existing population may be categorized into: 1. Totally dependent 2. Partial dependent and 3.Non- dependent on the water tank.

It is suggested to develop separate eco-development package for each category. The baseline data must be compared after successful implementation of the project. The various indicators of development like per capita income, health care, education status, extent of sanctuary dependency and empowerment of women must be well studied in all the targeted villages.

The EDC Approach

1. Rejuvenating the existing Eco-development committees (EDC) concerned with conservation by educating, motivating and eliciting participation in the eco-development villages. The guidelines prepared by the Ministry of Environment and Forests describes Eco-Development as a package of programmes that will demonstrate the concern of the forest department for the socio economic development of the fringe villages leading to promotion of co-operation of the village communities in the conservation and the management of bird habitats.
2. Create awareness among the target villages about the value of the fringe areas (in this case: agriculture fields: buffer) focusing on the vision of conservation of wintering bird communities of Udhayamarthandapuram Lake.
3. Achieve reduction in resource dependency (grazing pressure/wood collection/trapping of birds) of the sanctuary by providing alternative livelihoods thereby leading to habitat restoration of wet lands and conservation awareness among local people.
4. Provide opportunities for local people participation in sanctuary management through an institutional mechanism.
5. Enhance the capacity and upgrade skills of local people for alternate economic activities by way of organizing training courses and workshops on a periodical manner.
6. Active collaboration of local people in conservation by reducing adverse impacts of local people on biodiversity and also to reduce the adverse impact on bird habitats from local people providing alternative employment opportunities.
7. Provide micro financing with micro enterprises and by promoting self help groups through revolving fund at village level set up by a corpus fund. Ecological development has to be achieved by adopting a strategy of zero dependence of the sanctuary from sanctuary dwellers

Approach: Institutional Frame work – EDC

The institutional frame work of the EDC is managed by the Eco Development Officer (EDO). The EDO will be supported by a team of Eco Range Officers and Foresters. The institutional frame work of the EDC will be strengthened by local NGOs linkages. A team of staff members (Ecologist/Sociologist) will also facilitate the institutional mechanism of EDC. The financial powers are vested with the Village Forest Councils. VFC chairman and Member Secretary (Forester) jointly operate the accounts. In all the activities people's contribution of 25% and Government contribute remaining 75% for all activities. This mechanism has developed a successful mutual trust building with good rapport between the sanctuary fringe villagers and forest department staff.

Livelihood Support Initiatives through Village Micro Plan

A detailed micro plan will be prepared with the involvement of NGOs, facilitated by concerned Range Staff (Forester, Forest Range Officer and Forest Guard. The micro plan will be prepared by conducting PRA based process. The plan will be approved by the DFO which will be implemented by the EDC.

The Micro Plan includes the following components:

a) Tree Cultivation in Private Land

a) Community Asset Buildings

b) Individual Income Generation Activities

c) Alternate Energy and Energy Conservation Devices

d) Bio-Mass Regeneration

Micro Plan: Threat Analysis

The threat assessment of bird sanctuary reveals the following main issues that are being faced by the management.

a) Dependence of families among the fringe villages for firewood and grazing,
b) Incidences of more grazing in the bird habitats during dry season. The cattle also pose a real threat of spread of diseases to wild birds.
c) The population living adjoining the sanctuary polluting the tank through their daily activities.
d) Impact of pilgrim's pressure on certain festival seasons adjoining the bird habitats.
e) Trapping off birds outside the sanctuary in agriculture fields.

The specific benefits offered to the villages for livelihood support through the micro plan are mentioned below

Improve tree cover by distributing tree saplings for villagers and also promote their economic benefits in the long run with suitable packages under the Tamil Nadu Biodiversity Greening Project (TBGP). Various line agencies are also encouraged to involve in the micro plan of village communities in order to improve their livelihood improvement and social status. The following issues are targeted for the local people.

1. Improve the Livelihood Activities for Villagers
2. All Basic Amenities to be improved in Villages
3. Improve Education Level for both Sexes
4. Increase annual Income for individuals in the village.
5. Ensure Proper Health Care
6. Ensure employment opportunity in forestry works for EDC villages
7. Encourage land based activities are well conceived among the villagers as part of their sustainable livelihood programme

8.12 Factors that attracts migratory birds and its management

The following proximate factors attracts the diversity and abundance of migratory birds in Udhayamarthandapuram Sanctuary

1. Extent of water availability in the water bodies (wet lands, ponds, streams and agriculture fields)

2. Availability of aquatic vegetations

3. Abundance of fish and other food items, including aquatic insects

4. Extent of rainy days (Dam water and Monsoon rain besides water sources from depression effect

5. Availability of critical foraging grounds (creeks/munds/shallow/wet land areas)

6. Suitable Roosting Sites

7. Purity of fresh water

8. Suitable sites resting and nesting activities

9. Less biotic interference in water tank s

10. Suitable ambient temperature in day time

11. Availability of water at least for 9 months

12. Abundance of water insects in wet lands

13. Diversity of ground vegetation

14. Poor visitor's turn over to bird areas throughout the year

15. Localized availability of food resources throughout the year

16. Availability of open meadows with bunds

17. Selection of new areas by wintering birds in agriculture locations

18. Availability of more fresh water bodies in adjoining sanctuary

Migratory Birds and its Management

The wintering migratory birds to the Udhayamarthandapuram Bird Sanctuary are a boon to the lake eco system as part of biodiversity conservation. A variety of options are framed to strengthen the management of the sanctuary for migratory birds. The following are the major components under which the management objectives are addressed for the sanctuary:

Water Management: Conservation and sustainable development of any water bird sanctuary requires integrated planning for management at the river basin recognizing theinter- connections with its catchments and coastal processes. As the river basin are located in Karnataka and water flow for the sanctuary is from the Mettur Dam, the issue of catchment treatment is not relevant to this bird sanctuary.In addition to the conservation of water birds, the major purpose is to establish the effective management practices for restoration of the wetland system for the ecological and economic security of the people dependent upon the wetland resources for their livelihoods. The water source management will be looked into the following ways as part of improving the water regime capacity to the bird sanctuary.

a) Assessment of current water use and identification of conflicting interests
b) Propose measures for enhancement of water holding capacity using ecologically sustainable interventions
c) Develop action plan for rejuvenation for wetland and optimize water regimes and
d) Develop framework for water management considering human and ecological demands

Biodiversity Management:

Various biodiversity components will be executed in the field as part of improving habitat enhancement programme

a) Management of aquatic vegetation and control of invasive species

b) Measures for enhancing diversity of fish and other aquatic species

c) Reduce threats to water birds due to habitat modifications including water level changes and vegetation characteristics

d) Assess current threats to biodiversity due to changes in hydrological regimes, pollution and other anthropogenic pressures

Socio economic Development and Livelihood Improvement

The major steps to improve socio economic development and livelihood strategies are addressed with the following factors:

a) Improve and analyze livelihood assets with vulnerability and opportunities for interventions for livelihood improvement of communities

b) Develop strategies for income generation through micro enterprise based on sustainable use of wetland resources of the Udhayamarthandapuram Bird Sanctuary

c) Identify specific interventions in sample villages relating to livelihood improvement based on resource appraisal of land based agriculture activities.

d) Develop institutional development and capacity building and

e) Management practices to achieve integrated conservation and management of wetland and its feeder Channel.

f) Develop an effective monitoring and evaluation system for integrated conservation and livelihood improvement

g) Generate awareness about the values and functions of sanctuary at various levels within government, communities and related agencies

h) Identification of critical indicators (e.g. enhancement of bird diversity) for monitoring and evaluation of the strategies adoptedfor long term conservation of wetland

IV. Participatory Approach

The broad approach aimed for habitat restoration of bird habitats includes following:

a) Participatory approaches of involving local communities, NGOs and other stakeholders to ensure sustainability of habitat restoration schemes.

b) Revival of indigenous knowledge and traditional practices of local communities

c) Application of knowledge based field techniques for restoration through research and development activities.

d) Periodic monitoring and evaluation with focus on achieving the goals and objectives rather than merely activities.

e) The critical problems confronting Udhayamarthandapuram birds Sanctuary will be thoroughly analyzed to develop better habitat restoration as part of scientific management. The targets under each management objective will be assessed based on rapid field survey.

f) The Integrated Monitoring and Planning will be focused on biodiversity conservation and maintaining ecological processes and functions through land and water management.

g) Sustainable resource development is proposed to be achieved through fisheries and agriculture development.

h) Micro-enterprises involving value additions would provide additional / alternate income generation to the local communities.

i) Special emphasis has been laid on ecotourism development as an important tool for awareness programme about the wetland values and functions. Institutional development and community participation are envisaged as cross cutting components to achieve sustainable development of wetlands with participatory approach.

V. Eco-Tourism Improvement

The concept of Eco Tourism is proposed as part of conservation and protection strategy for the Udhayamarthandapuram Lake and Bird Sanctuary. The module will be planned to protect various endangered species and their habitats of wintering birds. With the implementation of eco tourism, the integrity of bird habitats is maintained through the participation of local communities along with the support of the forest department. Of late, the Eco Development Committees (EDC) has motivated the local communities in promoting their life style by weaning away their dependency on natural resources. Presently, this practice has been expended to different protected areas for conservation of biodiversity including important bird areas.

The theme of eco tourism has been focusing the upliftment of village communities in their socio economic development by sharing of their physical inputs to the forest development for its management. This could also benefit different tourist's stakeholders to provide comforts to enjoy wilderness by availing different eco friendly packages offered to them by the eco tourism activities. Further, the sanctuary management policy has been targeted to encourage the local communities in taking up responsibilities to launch various eco friendly activities based on site specific resources and other cultural values. In this context, the Udhayamarthandapuram Bird Sanctuary has the potentiality for initiating eco tourism because of rich biodiversity. Further, this site is famous for its unique bird diversity during wintering period from October to February.

Various eco tourism activities are proposed to attract the tourists for the sustainability of the bird habitats in the long run. The major tourist facilities proposed as part of eco tourism for the sanctuary are as follows:

a) As the area of the sanctuary is very small it is not possible to have a separate tourism zone. The entire sanctuary can be permitted for tourism activity.

b) More watch towers may be erected on the western bank near Acacia plantation. Eco rest sheds are required to meet the demands of visiting tourists. More camping equipments need to be purchased for bird watchers. An interpretation center with necessary materials may be developed for visitors. A qualified tourist guide-cum-Research Assistant needs to be posted on priority basis. The tank bund of the sanctuary can be converted into a nature trail. This can be done by strengthening the bund, clearing bushes and erecting interpretation signboards along the trail for visitors. More cement benches may be provided on the tank bund for the tourists for bird observation. Interpretation boards have to be erected at strategic places explaining the importance of the sanctuary and importance of birds.

c) Pamphlets and posters needs to be updated and freely made available for visitors. Eco camps have to be organized in the sanctuary to impart conservation education to various target groups. With the above information on the background the following activities may be taken up to promote eco-tourism and eco-awareness for attracting visitors to the bird sanctuary.

8.13 Rescue and Rehabilitation Plan

There is no scope for rescue of animals except for trapping of birds by traditional people in adjoining crop fields. The trapped birds are released in the presence of District Forest Officer. Rehabilitation plan for traditional bird trappers in the adjoining sanctuary areas could change their life style and they become conservationist. This has been tried in many protected areas and successfully implemented as well. Similar programme could be tried in the sanctuary on a demonstrative scale by identifying traditional bird trappers and involve them in forestry works with suitable alternate livelihood scheme as well.

CHAPTER – IX

Eco-tourism, Eco-development, Interpretation and Conservation Education

9.1 The Strategies

The eco-tourism is planned with the participation of local communities to improve their social status and there by strengthen the sanctuary in its sustainability and also promote eco tourism facilities. This could be achieved with the formation of eco tourism committees as per the guidelines of Government of India.

9.2 Eco –Tourism

The sanctuary at present is not attracting too many visitors primarily due to its isolated location. However with growing interest in Muthupet mangroves located nearby, the number of visitors is gradually increasing. Lack of adequate publicity is one of the main reasons for poor visitor arrivals. The sanctuary can be developed into a major attraction for the large congregation of Open bill storks. Presently there is facility for overnight halt in the sanctuary rest house located close by.

The sanctuary is free for visitors throughout the year. Visitors' entry regulation is not felt necessary at present as there is not much of a rush in the sanctuary. This may be considered depending on the number of visitors in future.

i. To promote wildlife tourism and create adequate awareness amongst the general public on bird conservation.

ii. To utilize the sanctuary as a center for imparting eco-education to students and local people.

Infrastructure Development

One watch tower has been constructed in the sanctuary for bird watching. An additional watchtower can be erected on the eastern bank. A tourist rest shed is presently available. But it is not sufficient as only a single room is available and additional facility needs to be created. The sanctuary needs to be provided with spotters for better bird viewing by visitors. A qualified tourist guide-cum-field Research Assistant needs to be posted on priority basis.

A few cement benches can be provided on the tank bund for the tourists to sit and watch birds. Interpretation boards have to be erected at strategic places explaining the importance of the sanctuary. For satisfying the information needs of the visitors to the sanctuary, pamphlets and posters needs to be prepared. Students and local people must be made aware about the importance of wildlife conservation. Eco-education camps have to be organized in the sanctuary to impart conservation education to these target groups. With the above information in the background the following activities need to be taken up on priority basis.

9.2.1 Principle

As the area of the sanctuary is very small it is not possible to have a separate tourism zone. The entire sanctuary can be permitted for tourism.

9.3 Intervention

a. Establishment of 20 bedded dormitory for accommodating students.

b. Establishment of interpretation centre with audio visual facilities.

c. Extension of the existing nature trail to cover the entire bund of the tank.

d. Establishment of visitors resting place at important locations.

e. Establishment of visitor's information centre with toilet, refreshment facilities.

f. Establishment of watch towers wherever necessary.

g. Providing adequate number of binoculars and spotters.

h. Printing of adequate number of posters, pamphlets, bird identification guides etc.,

i. Creation of Website for awareness creation and publicity

9.3.1 Formation of Eco Development Committee's (EDC's)

Atpresent four Eco Development Committeesarefunctioning in Udayamarthandapuram Bird Sanctuary. It is also planned to constitute a few more EDC for a better "social fence" between forest authorities and local people to protect the bird habitats in the long run. The existing EDC are as follows:

1. Serupanaiyur
2. North Paliyanmedu
3. Pinnathur
4. Mannavangotagam

(The constitution details of EDC are mentioned in the section 8.3 of this report.)

9.3.2 Eco-Guides

There is no eco-guide available in the bird sanctuary for thetourists to guidein the sanctuary. In many protected area, the eco-guides are used as temporary watchers during the tourist season. Similarly eco-guides may be used in the sanctuary from October to March (six months) by deploying youth from the existing EDC (Sirupanaiyur & Pinnathur) and payment may be made as per the guidelines of APW

Line agencies namely Education Department, Panchayat, Tourism, Revenue Agriculture, and PWD should be involved in regulation and development activities of the sanctuary beyond the forest department. The main activities of these organizations relate to implementation of various habitat restoration programmes for land and water management, socio-economic development and conservation of natural resources for the benefit of the bird habitats.

9.4 Linkage

Line agencies namely Education Department, Panchayat, Tourism, Revenue Agriculture, and PWD may involve in regulation and development activities of the sanctuary beyond the forest department. The main activities of these organizations relate to implementation of various habitat restoration programmes for land and water management, socio-economic development and conservation of natural resources for the benefit of the bird habitats.

9.5 Participatory Management

The management of the Bird Sanctuary is focused with people's participatory approach management to conserve the integrity of the sanctuary with the involvement of villagers in forestry works such as plantation, weed removal, and other development works of the sanctuary. Participatory approaches involving local communities, scientists, NGOs and other line agencies are ensured for sustainable management of the Udayamarthandapuram sanctuary. The existing Eco Development Committee members are involved in the habitat restoration activities of the sanctuary through participatory mechanism. For an effective people's participation, participatory rural appraisal was conducted to prepare micro plan for each village to reduce the forest dependent on the sanctuary by local communities. With the implementation of participatory management, the biodiversity of the sanctuary is protected with its long term sustainability.

9.6 Publicity, Eco awareness and Nature Camps

Among the various management activities, eco-awareness program on various themes for various stakeholders would be a crucial management step for conservation of the Udayamarthandapuram Bird Sanctuary. Therefore, a separate eco awareness and nature camps could be significant to promote management strategies for the sanctuary with the enrichment of knowledge through eco-awareness and conducting nature camps to various stakeholders visiting the sanctuary. At present such a practice of eco

awareness and organizing nature camps are not well organized for visitors and students in the sanctuary.

Theaim of theeco-awareness programme for the sanctuary at Udayamarthandapuram is to spread the conservation significance about the biodiversity of the bird sanctuary to various stakeholders (local people/forest field staff/line agencies) in order to protect the bird lake in a sustainable manner with participatory approach. It is true that the problems in wildlife conservation are intricately related to the quality of the local communities. Unless this underlying problem is solved, efforts to ensure bio diversity conservation can hardly succeed. In this context, eco-awareness plays a major role for protection of Bird Sanctuary. It is realized that the knowledge gained through the awareness program is a positive approach for scientific management of sanctuary and wildlife. Experiences in protecting bird habitats have revealed that unless a strong eco-awareness program framed periodically, the management of biodiversity conservation goals could not be achieved to a desired level. Such an approach could lead to a sustainable management strategy for the benefit of the lake sanctuary.

Objectives of Eco-Awareness

1. Educating, motivating and eliciting various components of bird sanctuary
2. Sharing of knowledge about current forest policies and conservation issues
3. Scientific management of Udayamarthandapuram Lake with the participation of local communities and line agencies

The following major themes will be considered as part of eco awareness and nature camps programme for various stakeholders:

1. Significance of the bird habitats
2. Landscape Richness: Bird Diversity
3. Wet land Eco system and importance of tank to local communities (water basin)
4. Biodiversity Values (Wet lands/Wintering grounds for migrants and Land birds)

Eco- awareness program and nature camps will be targeted with the following modules

1. Significance of Bird Sanctuary and Lake Eco-System
2. Identification of Birds (Nesting/Roosting/Feeding sites) critical resources
3. Field documentation procedure
4. Assessment of bird habitats in relation to threats
5. Identification of critical areas for birds
6. Use pattern of lake by birds in relation to water regime and aquatic habitats
7. Field Techniques of identifying wintering birds
8. Role of birds in wetland ecosystem
9. Threats to the bird area

Other modules as part of eco-awareness program and nature camps:

a) Create awareness about the value of the wet lands, focusing on the vision of conservation and need for protecting various critically endangered bird species and their habitats

b) Targeting reduction of resource dependency by local communities and there by leading to overall habitat restoration programme

c) Develop a joint protocol mechanism by involving various institutions / stakeholders in Protected Area Management through an institutional approach

d) Formulate a strong skill development and confidence building among the locals to manage the bird sanctuary in a long term basis

e) Co ordinate with district administration in administrating the water tank for the benefit of birds and local farmers

Potential agencies identified for the eco-awareness program and Nature camps

a) Public Works Department
b) Fisheries Department
c) Panchayat Union
d) Agriculture Department
e) Tourism Department
f) Revenue Department
g) Animal Husbandry Department

The above institutions are contributing their services both directly and indirectly for an integrated management of Udayamarthandapuram Bird Sanctuary. These institutions are targeted to obtain their support in the scientific management of the water basin for the benefits of wintering birds and also to preserve the integrity of the landscape with sustainability.

Eco-Awareness Experts

The experts from the following institutions will be made a tie up arrangement for the programme to take classes on eco awareness and nature camps in the field.

1. A V C College (*Autonomous*), Mayiladuthurai

2. Bombay Natural History Society (BNHS), Camp-Kodiyakarai

3. Environmental Science: Bharathidasan University, Trichy

4. Care Earth, Chennai

5. Wildlife and Environment Trust – WET, Mayiladuthurai

6. Arumbugal Trust, Thirunelveli

Target groups for the Eco-Awareness and Nature camps

a) School children (local and from other districts)
b) Visitors to the sanctuary
c) Local communities: EDC members/VFC members/covered under the TBGP programme and Women Self Help Groups
d) Frontline field staff of the Forest Division
e) College students and research scholars working on wetlands conservation
f) Various Line agencies
g) Bird Trappers (Traditional People)

9.7 Interpretation Center- Design and Plan

An interpretation center with necessary materials and fecilities may developed for visitors in future.

9.8 Learning Gardens

Specific learning garden relevance to the sanctuary area is not available to the tourists in the sanctuary. It is planned to develop a comprehensive learning garden, for identification of birds using sounds and habitat modules. Eco learning gardens of medicinal garden could also attract the tourist in the learning centres. The learning garden could be used to train the frontline field staff from various wetland protected areas as part of their field exposure cum knowledge improvement on migratory birds. Hence, a learning centre to be established in the sanctuary for the benefit of tourists and field staff.

9.9 Environmental Education

Students from nearby schools and colleges are regularly visiting the sanctuary during the season as part of environmental education programme. Proper facilities for environmental education activities are not available to the students, although it is planned to provide such a comprehensive module to visiting students with the facility of interpretation centre. Film show on the importance of environmental education will be made available to them in the interpretation centre.

9.10 Nature Trails/ Walk through

The 2 km Nature trail is exclusively meant for visitors to observe birds. There are four cement watch towers are available to the tourists for sighting of birds. The visitors are being provided with binoculars for bird watching.

CHAPTER - X

Research, Monitoring and Evaluation

10.1 Research

There is not adequate research works were carried out in the sanctuary, except some works on birds from the students from A V C College for their MSc dissertation works.

10.2 Prioritization of Research - Long, short and medium term

There is complete absence of departmental research on migratory birds. Monitoring is limited to taking daily bird count by the field staff and conducting annual census whenever funds permit. Monitoring of birds visiting the sanctuary, its habits and habitat has to be done in a continuous manner without fail. For this purpose a Research Scientist has to be engaged for the purpose. The following activities are suggested

a) Engaging field Research Assistant for continuous monitoring of the sanctuary
b) Promoting basic and developmental research by Universities, Research institutions and NGOs.
c) Conducting Annual Bird Census

Training:

At present there is no staff in the sanctuary with training in wildlife management. Training to the staff would improve their efficiency and would allow them to provide proper information and guidance to the people. A short term training programme can be organized for the staff. Promising staff can be deputed for training to Bombay Natural History Society for intensive training. The following capacity building training is required

a) Annual refresher course on census to frontline staff
b) Annual refresher course on wildlife management
c) Wildlife Management training to the interested frontline staff through Wildlife institute of India, BNHS, etc.
d) Study and exposure visit to frontline staff and wildlife managers.
e) Preparation and supply of bird and vegetation identification book of this sanctuary. There is no departmental research and analysis so far. Now, under TBGP scheme the following preliminary studies are proposed

Implement Wetland Action Plans

a) Enhance aquatic habitats and aquatic species diversity

Plantations

Acacia niloticaand other species (Lilly, lotus) plantations have been raised and regular monitoring has been done by the management. To control the movement of livestock cattle grazing in the drain season we engaged a person for monitoring the cattle movement for 5 months.

Removal of Invasive Species

Weed removal has been done periodically in the sanctuary by using daily wages workers. Annual removal of *Ipomea* and other weeds to be carried out for creating more water spread area for birds.The exotic species such as *Eichhorniacrassipes, Salviniaauriculata, Pistia stratiotes, Lemna minor, Wolffiasps.* And*Azollapinnata*often form thick mats in different areas of the lake and thus alter the native vegetation. These species have reached a statusand thereby affect the overall composition of aquatic plants in many areas. Water Hyacinth and *Ipomeacarnea* are the two invasive weeds replacing the native macrophytes, the major attractants to the migratory and resident ducks. The rapid expansion of these species would ultimately affect the biodiversity of the Lake including birds and ultimately affect larger heronry species for nesting and facilitate the free movement for the swimming birds.

Removal of alien species is to strengthen the habitat restoration of the lake

***Prosopis juliflora* is peridically removed from the water tank**

b. Enhance peripheral and nearby terrestrial habitats for birds

This Sanctuary is dominantly surrounded by agricultural fields. The birds are frequently visited the agro fields e.g. Oriental White Ibis, Asian Openbill,and Egrets, the birds were often hunted or capture alive bythe local villagers and Narikuravas, so to minimize the conflict between formers and the management we planted some of the fruit bearing plantson the peripheral area of the Sanctuary.E.gBarringtonia, banyan tree, Thazhampoo plant

Monitor/ Document aquatic vegetation

Documentation of the flora including aquatic vegetation and fauna (Birds, Mammals, Reptiles, fishes Amphibians, Dragonflies, Damselflies, and Butterflies) of the Sanctuary is properly identifying by the expert through the photographs taken from the Sanctuary. The check list will be made by the biologist engaged by the department and the preliminary work was started in the Bird Sanctuary.

Monitor bird diversity and abundance 2013-14

Annual census of water birds is carried out in the month of November-December when species variety and population is high. The practise of taking daily water bird count during migratory season was introduced in September 2000 and the register is maintained properly by the management.

Monitor bird diversity and abundance 2014-15

Annual census of water birds will be carrying when species variety and population is high. Bird diversity, Species diversity, preferable plant species for the bird, introducing artificial nests and observed the utilization will be monitor. Few number of bird count station will be established at random location in the sanctuary and the bird count will be regularise throughout the season.

Routinely survey birds for contagious diseases (e.g.bird flu)

Managers receive basic training in routine checking for outbreaks of avian flu and any other diseases transmitted by birds. However the veterinary doctor from respective division made visit to the sanctuary in a periodical manner to assess the wetland and the register is properly maintain by the management. A daily wages worker was engaged with the doctor for helping the field work and operating the boat.

Interpret and display research findings in multi-media for benefit of visitors (Tamil & English)

There are no in house researchers present in the sanctuary. The forest department engages with the academic institutions for carrying out research studies. Every year students come to the sanctuary from various colleges and participate in water bird census. The management is now preparing the video documentary on Vaduvoor water birds. This will be going to telecast with good multi-media instruments to the visitors in interpretation centre which is under construction. Further bird callings, puzzles will be the benefits of the visitors it will create the awareness to the visitors on Vaduvoor bird sanctuary and birds.

10.2.1 Integration of Wetlands within the Landscape Matrix: Bird Habitat Corridors

There are several smaller bird habitats are located outside the Udamarthandapuram Bird Sanctuary which connects the Point Calimere Wildlife and Bird Sanctuary, Panchanathikulam, Udayamarthandapuram and beyond as connecting migratory paths to birds. These sites attract thousands of migratory birds with the result of contiguous lagoons and wetland patches. The distribution of wetlands within the landscape provides an ideal location for "***stop over***" for wintering grounds to migratory birds for their foraging and shelter. This long stretch of wet land area is well protected and the extent of human induced disturbance is less and hence this area is highly used by the birds both migratory and resident populations.

10.2.2 Regional and National Monitoring of Populations

Various national and international institutions are tied up to monitor the migratory population. BNHS has already working on the programme with various international organizations as part of their studies on bird migration in India. Such an institutional arrangement may be made to assess and monitor the bird population and its arrival and dispersal from the sanctuary.

10.2.3 Fragmentation effects

There is no notable impact of fragmentation on the Udhayamarthandapuram Bird Sanctuary and habitat with the influence of biotic interference.

10.2.4 Human Resource Development

The HRD program for the forest field staff could gain their knowledge on conservation and protection of the bird sanctuary, especially protection of wintering grounds through habitat restoration, management of water regime and biodiversity conservation initiatives with people's participatory approach. Orientation and skill development are the two major exercises important to the forest field staff on various themes related to the management of the sanctuary using various experts. The themes are identified based on the management priorities for conservation of wet lands, and protection of wintering birds. The orientation will be designed to improve capacity building and skill development of field staff namely; Foresters, Forest Guards, Forest Watchers and Anti Poaching Watchers. The following modules are intended for the programme to uplift their professional knowledge in managing the bird sanctuary by the forest field staff.

Field Orientation: Basic Approach

The orientation will be done to the field staff with a priority on understanding various field protocols. These are fundamental field issues to implement various field management programmes in a scientific basic:

Major fundamental issues covered under the orientation to the Forest Field Staff by the experts are

1. Assessment of bird habitats
2. Identification of birds in the field
3. Understanding use pattern of birds
4. Identification of critical areas to birds
5. Scientific documentation of field diaries
6. Learning techniques of identifying animals and plants
7. Strategies to control illegal bird trapping
8. Management and Administrative protocol
9. Management of Eco Development Committee
10. Management of Eco Tourism Committee
11. Promoting Communication Skills
12. Understanding leadership quality
13. Learning conservation and awareness techniques
14. Proper documentation of field cases and registration

10.2.5 Water level control

The capacity of the water holding area of the sanctuary is almost equal to the canal and hence the water level always under the control.

10.2.6 Control of Pesticide Use

The impact of pesticide is not notably seen in the tank**.**

10.2.7 Regulation of Human Disturbance

The extent of human disturbance is minimum in the sanctuary area and it is being regulated by constant dialogues with villagers including awareness about the importance of the Bird sanctuary.

10.2.8 Public Awareness concerning wetlands

It is noticed that poor public awareness prevails among the local people about the wet lands and bird habitats. Nevertheless, the local communities have a special appreciation about the location of Udayamarthandapuram Bird Sanctuary and its importance to the tourists.

10.2.9 Ecological Assistantce

The ecological value of the bird sanctuary is mostly supported by the co-ordinated efforts of various line agencies beyond the Forest Department. Such Assistant provides conservation platform to achieve the management goals of the sanctuary in the long run.

10.3 Valuation of eco system services

The eco system of the bird sanctuary is so dynamics in terms of Lake Eco system along with its migratory and land birds and thus rich in biodiversity for wet land conservation.

10.4 Monitoring and Evaluation

The monitoring exercise should be done by the field staff with reference to various development activities in the bird habitats. Ideally monitoring and evaluation works to be done by conducting a mechanism of feedback dialogues with field staff and local communitieson the works done on various management activities. The monitoring works to be done by the Forest Range Officers and DFO towards the merits and demerits of development works. The monitoring exercise would bring out a workable "state of art" for bird sanctuary that helps the habitats in the long run.

Monitoring: Criteria

A) Evolve various field criteria for scientific monitoring especially the impact of water regime in the sanctuary.This might evolve a positive step to bring out a workable module towards the conservation initiatives for bird habitats.

B) The outcome of the project monitoring and evaluation will bring out changes in overall biodiversity of the Udayamarthandapuram Bird Sanctuary, although there is no specific guidelines are now available to the field staff for monitoring exercise except routine protection and attending habitat restoration works.

Monitoring: Process

The monitoring process of the sanctuary would generate a framework for action plan that might evolve according to the up gradation of habitats on various parameters for scientific management along with co-existence with local people.

The management of the bird habitats should continue to ensure monitoring process which should form routine management initiative. This could enable to identify the trends in changes of key habitat parameters such as water regime in the tank. The field staff could document and collect basic biological data from the field using beat maps and this could help in various ways, especially occurrence of bird species throughout the year. These data sources shall be made available in the office with proper compilation by field experts.

CHAPTER – XI

Miscellaneous Regulations

11.1 Disease Management

The sanctuary is surrounded by villages. Each village has more number of domestic animals (stray cattle, goat, dogs and other poultry). With the movement of livestock inside the bird sanctuary, there is always a possibility for spreading of contagious diseases into bird fauna. The problem of disease spread might be higher during the summer period from March to April when livestock is mostly dependent on Udayamarthandapuram for foraging. Prompt reporting of an infectious animal disease or its symptoms to livestock population is crucial as part of wildlife management. Disease could spread rapidly to wild birds if not noticed in right time. In this context, immunization has been regular in practice for livestock belonging to the villages bordering the Bird Sanctuary. Nevertheless, people who own or keep livestock are responsible for their care and health. The sanctuary managementhas set a number of rules to monitor the health of kept animals with the local communities.

11.2 Strategies

Periodical vaccination for livestock is undergoing in the bird sanctuary by Veterinary Department Personnel (Udayamarthandapuram) every year, especially in the summer. The following contagious disease is identified in the livestock and immunization drugs are provided with the help of Forest Department by organizing special camp in the villages bordering the bird habitats. The village covered under the vaccination programme are; 1. Udayamarthandapuram 2. Nachikulam 3. Sirupanaiyur 4. Pinnathur 4. Mannavangotagam 6. Karaiyanmedu and 6. Alkativeli

Immunization for Contagious Diseases

1. Avian influenza – bird' flu
2. Bovine spongiform
3. Tuberculosis
4. Foot and mouth disease
5. Anthrax
6. Rinder pest
7. Footrot
8. External parasites
9. Rabies
10. Ecto-parasites

11.3 Intervention

Various immunization components to be taken into account with the veterinary personnel and wildlife experts to prevent dissemination of diseases to water fowls in the tank.

1. Maintain proper hygiene in the vicinity of villages
2. More care and management in maintaining livestock during the dry spell of the year
3. Try to identify initial symptoms of diseases among domestic livestock
4. Care to be taken while purchasing new animals
5. Call for a veterinarian immediately for any suspected diseases in livestock.
6. Livestock drinking from contaminated rivers and streams may be avoided
7. Do not bury or burn died animals in the open, other than in exceptional circumstances

The awareness themes could lead to develop a better management of livestock in the following ways with most effective ways of eliminating disease from cattle. The main benefits of the awareness programme are: a) improved farm expansion b) improved farm sustainability c) better stock health and welfare and d) a farmer/veterinarian relationship ensured

a) Guidelines for the local communities/farmers

A Set of important guidelines to be provided to the farmers about the up keeping of their live stock to prevent disease eruption and spread.

Some of the diseases are more prevalent during special festivals within the bird sanctuary (example: bird flu) with the result of overcrowd of visitors and livestock. During this period, those diseases are prevalent and likely to affect the wild birds. During this period of special event the Forest Department in close co operation with animal husbandry will organize mass immunization program to prevent the cattle borne diseases spread to bird habitats.

CHAPTER - XII

ORGANIZATION, ADMINISTRATION AND HUMAN RESOURCES DEVELOPMENT

12.1 Structure and Responsibilities

The Udayamarthandapuram Bird Sanctuary is part of the Tiruvarur Forest Division and managed by the Muthupet Forest Range Officer with the administrative guidance of the District Forest Officer, Tiruvarur District. The field level administration is vested with the Forest Range Officer, Muthupet (HQ- Muthupet) who has been assisted by one Forester, one Forest guard and a watcher besides Four Anti Poaching Watchers. The sanctuary falls under the administrative control of the Conservator of Forests, Trichy Circle

12.2 Staff Amenities

There are no proper staff amenities available at the Udayamarthandapuram Bird Sanctuary, except quarters for Forest Guard, Resting room for APW, Visitor Rooms (2) and Sanitation facilities. Residential quarters are not available to other staff members.

12.3 Human Resources Development

HRD for the staff is mainly organized in Tamil Nadu Forest Academy (Coimbatore) for special orientation programme on TBGP scheme, Human Animal Conflict and other special short term refreshing courses.

12.3.1 Training Calendar for the Year

There is no specific training calendar scheduled for the front line field staff**.**

CHAPTER – XIII

DRAFT NOTIFICATION OF ECO-SENSITIVE ZONE FOR UDHAYAMARTHANDAPURAM BIRD SANCTUARY, THIRUVARUR DISTRICT

MINISTRY OF ENVIRONMENT AND FORESTS

Draft Notification

Boundaries of Eco-sensitive Zone:–

(1) The said Eco sensitive Zone is an area of 645.71 ha up to 1 km radius from the boundary of the protected area of Udhayamarthandapuram Bird Sanctuary in North, West, South and East direction situated in the Thiruvarur District of Tamil Nadu.

North	E079.555598	N10.464653	West	E079.542779	N10.449874
South	E079.552135	N10.435691	East	E079.567461	N10.446198

Total area of Eco sensitive Zone of Udhyamarthandapuram Bird Sanctuary

S. No	Name of the Area	Extent in Ha	Legal Status
1	Govt. poramboke land in 5 revenue villages	107.00	Revenue Poramboke Land
2	Private Patta lands in 5 Revenue villages	538.71	Revenue Patta Land
	Total area	**645.71 Ha**	

Monitoring Committee:-

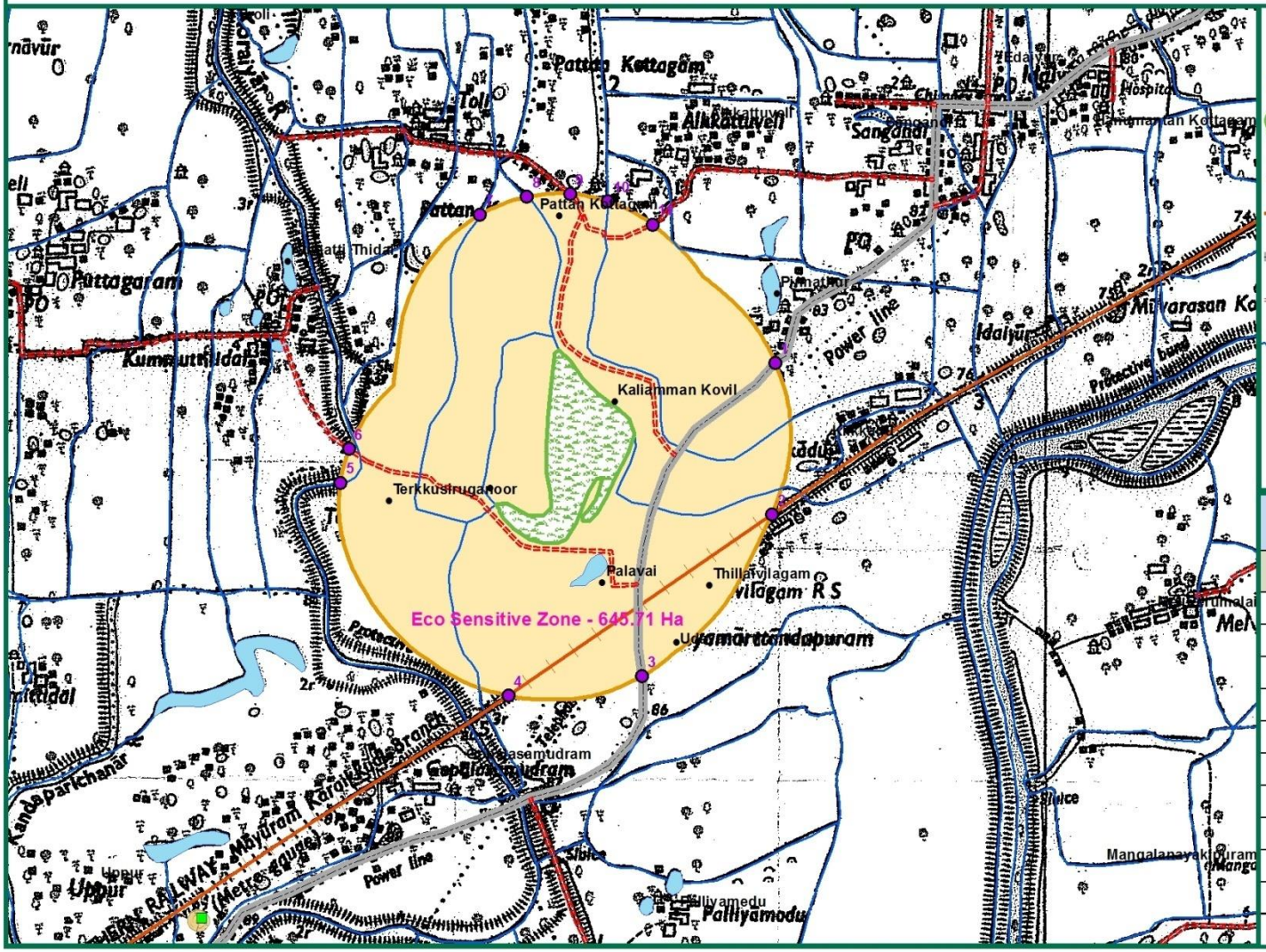
a) In exercise of the powers conferred by sub-section (3) of section 3 of the Environment (Protection) Act, 1986) 29 of 1986, the Central Government hereby constitutes a committee to be called the Monitoring Committee to monitor the compliance with the provisions of this notification.

b) The Monitoring Committee referred to in sub-paragraph (1), shall consist of not more than ten members so as to represent the following, namely:-

1	District Collector, Thirurur	Chairman
2	District Forest officer, Thirurur	Member Secretary
3	Revenue Divisional Officer, Mannargudi	Member
4	The District Environmental Engineer, Tamil Nadu State Pollution Control Board, Nagapattinam	Member
5	An Ecologist (Thanjavur Tamil University)	Member
6	A representation from Town Country Planning Department	Member
7	A representation from local NGO	Member
8	A representation from Ministry of Environment, Forests and Climate Change, Government of India, New Delhi	Member

ECO SENSITIVE ZONE MAP OF UDAYAMARTHANDAPURAM BIRD SANCTUARY
THIRUVARUR FOREST DIVISION

ECO SENSITIVE ZONE - 645.71 Ha



Legend

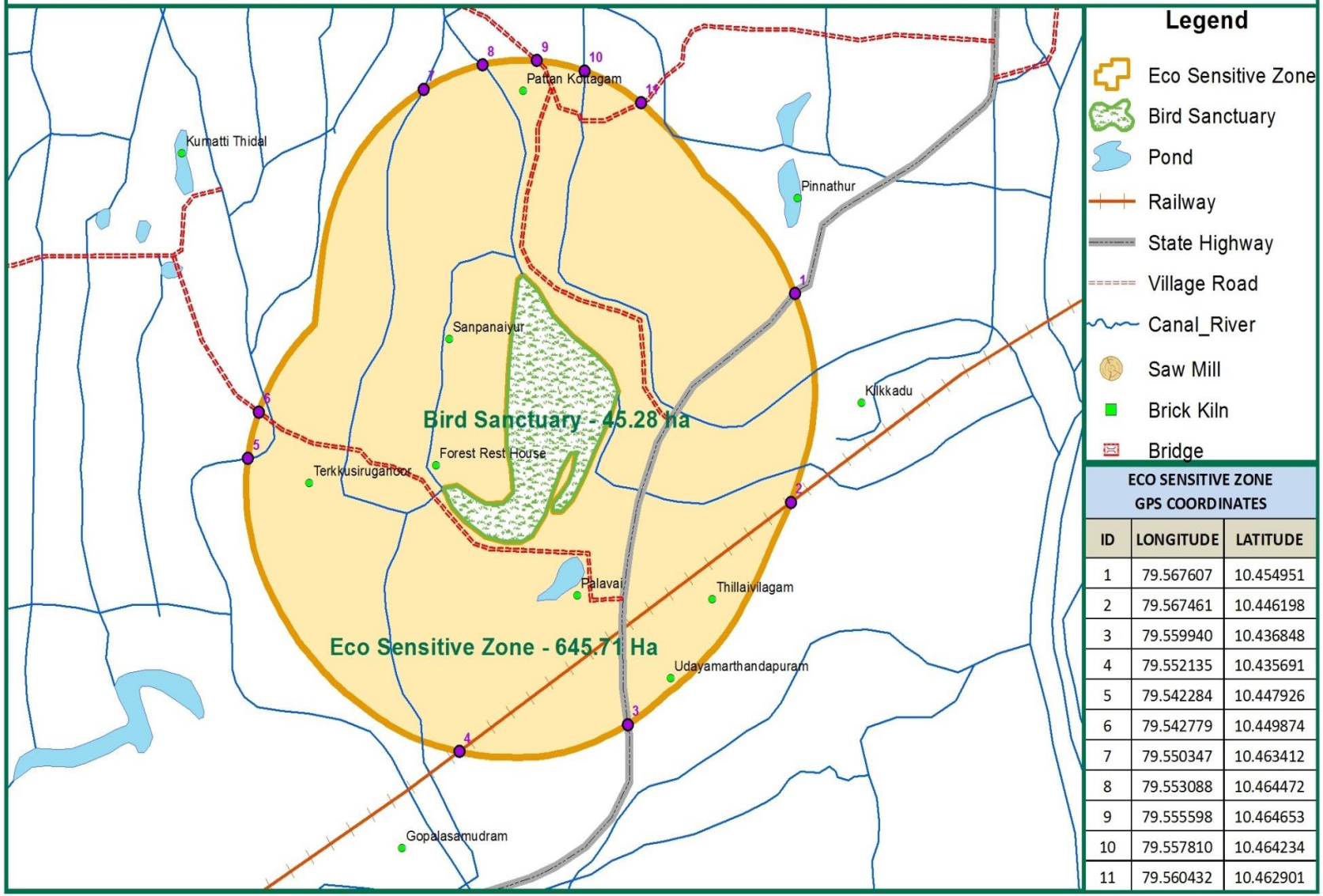
- Eco Sensitive Zone
- Bird Sanctuary
- Pond
- Railway
- State Highway
- Village Road
- Canal_River
- Saw Mill
- Brick Kiln
- Bridge

ECO SENSITIVE ZONE GPS COORDINATES

ID	LONGITUDE	LATITUDE
1	79.567607	10.454951
2	79.567461	10.446198
3	79.559940	10.436848
4	79.552135	10.435691
5	79.542284	10.447926
6	79.542779	10.449874
7	79.550347	10.463412
8	79.553088	10.464472
9	79.555598	10.464653
10	79.557810	10.464234
11	79.560432	10.462901

ECO SENSITIVE ZONE MAP OF UDAYAMARTHANDAPURAM BIRD SANCTUARY
THIRUVARUR FOREST DIVISION

ECO SENSITIVE ZONE - 645.71 Ha



Legend

- Eco Sensitive Zone
- Bird Sanctuary
- Pond
- Railway
- State Highway
- Village Road
- Canal_River
- Saw Mill
- Brick Kiln
- Bridge

ECO SENSITIVE ZONE GPS COORDINATES

ID	LONGITUDE	LATITUDE
1	79.567607	10.454951
2	79.567461	10.446198
3	79.559940	10.436848
4	79.552135	10.435691
5	79.542284	10.447926
6	79.542779	10.449874
7	79.550347	10.463412
8	79.553088	10.464472
9	79.555598	10.464653
10	79.557810	10.464234
11	79.560432	10.462901

Chapter-XIV

Budget

14.1 Financial forecasting

Conservation

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1	Providing revetment arrangements in the boundaries of the sanctuary	500 RM	27.98	500 RM	29.00	300 RM	18.30	300 RM	19.50	200 RM	13.60
2	Providing paver block in path way	500 RM	18.07	500 RM	19.50	300 RM	12.60	300 RM	13.50	300 RM	15.00
3	Deepening and strengthening of existing sanctuary water logging areas	3000 M3	3.00	3000 M3	5.70	2500 M3	5.25	2500 M3	6.25	2500 M3	7.00
4	Eradication un wanted weeds	10 Ha	1.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00
5	De-silting and cleaning the water channels	3000 RM	2.10	-	-	3000 RM	2.40	-	-	3000 RM	2.70

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
6	Formation of Smaller Bunds and Island Formation	10 Nos	1.50	-	-	10 Nos	1.70	-	-	10 Nos	1.70
7	Planting of bamboo saplings	500 Nos	0.25	-		500 Nos	0.30	-	-	500 Nos	0.35
8	Training Programme for field staff/Line Agencies/ETC/EDC on capacity and skill development	12 Nos	1.80	12 Nos	1.80	12 Nos	1.80	12 Nos	1.80	12 Nos	1.80
	Sub Total		**55.70**		**58.00**		**44.35**		**43.05**		**44.15**

Protection

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1	Strengthening and improvement of the sanctuary boundary Example Construction of boundary pillars	1500 M^3	1.05	1500 M^3	1.05	1500 M^3	1.50	1500 M^3	1.50	1500 M^3	1.50
2	Purchase of Binoculars and Telescope for Bird watching	LS	2.00	-	-	LS	2.00	-	0	LS	2.00
3	Construction of New Watch Towers	2 Nos	20.00	-	-	-	0	-	0	-	0
4	Improvement of existing watch towers	LS	2.00	-	-	-	0	-	0	-	0
5	Engaging antipoching watchers in Sanctury area	2 nos	1.62	2 nos	1.62	2 nos	1.62	2 nos	1.62	2 nos	1.62
	Sub total		**26.67**		**2.67**		**5.12**		**3.12**		**5.12**

Infrastructure

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1	Improvement of existing entrance	1 No	10.00	-	-	-	-	-	-	-	-
2	Drinking water facilities for tourists (LS) with proper pipe line in bird walk area	LS	5.00	-	-	-	-	-	-	LS	1.00
	Sub total		**15.00**								**1.00**

Eco-Awareness &Tourism

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1	Purchase of Eco Van for visitor to the lake area	1 No	11.00	-	0	-	0	-	0	-	0
2	Engaging van driver and fuel, maintenance of Eco-van	LS	1.80	LS	2.40	LS	2.76	LS	3.00	LS	3.24
3	Eco Bird voices along the trail path	LS	3.00	-	0	-	0	-	0	-	0
4	Establishment of a Eco cafeteria for the visitor	LS	3.00	-	0	-	0	-	0	-	0
5	Training bird identification centre for youth	LS	1.00	-	0	-	0	-	0	-	0
6	Periodical monitoring and evaluation of Eco Tourism and Report Preparation	LS	0.50	-	0	-	0	-	0	-	0

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
7	Removal of vegetative cover	1500 RM	0.23	-	0	1500 RM	0.30	-	0	1500 RM	0.375
8	Display boards of critically endangered birds with	20 Nos	4.00	-	0	10 Nos	2.50	-	0	15 Nos	3.30
9	Establishment of Eco friendly	10 Nos	1.00	-	0	8 Nos	0.96	-	0	10 Nos	1.50
10	Wooden Eco Sheds for visitors (Umbrella Structure) (4 Nos) with proper facilities in bird walk areas	4 Nos	2.00	-	0	4 Nos	2.20	-	0	4 Nos	2.40
11	Repairing cost for the existing bird walk areas	200 Rm	6.00	-	0	200 RM	6.00	-	0	200 RM	6.00
12	Establishment of dust pins with slogans along the bird walk	10 Nos	5.00	-	0	-	0	-	0	-	0

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
13	Organizing Eco awareness Camps for local communities and local Panchayats	3 Nos	0.45	-	0	-	0	-	0	-	0
14	Appointment of Eco-Guide	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62
15	Preparation of Booklets and Pamphlets	LS	0.50	-	0	-	0	-	0	-	0
16	Awareness programme for Schools of Thirvarur District	5 camps	0.50	5 camps	0.75	5 camps	0.75	5 camps	0.75	5 camps	0.75
17	Training Anti-poaching watchers in bird identification as an expert	LS	1.00	-	0	-	0	-	0	-	0
	Sub Total		**42.60**		**4.77**		**17.09**		**5.37**		**19.185**

Research:

Sl.No.	Name of the Component	2016-17		2017-18		2018-19		2019-20		2020-21	
		Qty.	**Amount**	**Qty.**	**Amount**	**Qty.**	**Amount**	**Qty.**	**Amount**	**Qty.**	**Amount**
1	Conducting periodical bird census	1 No	0.50	1 No	0.50	1 No	0.50 No	1	0.50	1 No	0.50
2	Engaging a biologist	1 No.	2.16	1 No.	2.16	1 No.	2.16	1 No.	2.40	1 No.	2.40
	Sub total		**2.66**		**2.66**		**2.66**		**2.90**		**2.90**

14.2. Summary of Prescriptions

14.2.1. De-silting and cleaning of the channels

De-Silting and cleaning of existing channels are very important to retain the water holding capacity and water flow for the Bird Sanctuary. The UBS have lost the water holding capacity due to years of siltation because de-silting activity hasn't done since 1999.Due to silting the original depth was spoiled in this sanctuary so de-silting of the Bird Sanctuary needs to be carried out on a priority basis. The tank depth needs to be increased by a meter at least, this will help to retain more water for birds as well as for agriculture and it's attract more water birds towards the Sanctuary. The de-silted soil should be removed from the sanctuary to outside. The necessary permission may obtain from the District administration for removal of the de-silted soil.

Degradation of the feeder channel will directly affect to the water absorption capacity of the Sanctuary and induce the soil erosion. It is necessary to undertake the control measures for feeder channel conservation to ensure regulation of water flow regimes and maintenance of the hydrological functions of the wetland system. Water inflows and outflows to the lake should be estimated with the help of hydrological experts. Assessment of water holding capacity of the Sanctuary should be attempted through various analysis of data generated from contour surveys.

14.2.2. Uprootal/removal of invasive species

The increasing of invasive species is one of the major problem to the managers. Periodical removal of such species is undergoing every year but the invasion such species continuously growing in some areas of the sanctuary. The invasive species such as*Eichhorniacrassipes, Salviniaauriculata, Pistia stratiotes, Lemna minor, Wolffiasps.* And*Azollapinnata*often form thick mats in different areas of the lake and thus alter the native vegetation. These species have reached a status and thereby affect the overall composition of aquatic plants in many areas.

Water Hyacinth and *Ipomeacarnea* are the two invasive weeds replacing the native macrophytes, the major attractants to the migratory and resident ducks. The rapid expansion of these species would ultimately affect the biodiversity of the Lake including birds and the larger heronry species for nesting and facilitate the free movement for the swimming birds. Therefore, it is recommended to thin the lower and inner branches of Acacia *nilotica* trees where ever distributed. Control of *Prosopischilensis, Eichhorniacrassipes, Ipomeacarne*a and other species to provide additional water holding capacity and enhancement water depth and water spread area.

14.2.3. Conducting Periodical bird census

Conducting bird census has been a regular activity in the sanctuary since 2000. It is conducted generally in the month of November-December when the species diversity and population is high. Census is conducted by the sanctuary staff along with ornithologist from the various institution and wildlife organizations.

14.2.4. Eco awareness camps

Eco-awareness program on various themes for various stakeholders would be a crucial management step for conservation of the Udayamarthandapuram Bird Sanctuary. Therefore, a separate eco awareness and nature camps would be significant to promote better management strategies for the sanctuary with the enrichment of knowledge through eco awareness and conducting nature camps to various stakeholders.

The aim of the eco-awareness programme for the sanctuary at Udayamarthandapuram is to spread the conservation significance about the biodiversity of the bird sanctuary to various stakeholders (local people/forest field staff/line agencies/School & Collage Students) in order to protect the water tank in a sustainable manner with participatory approach

The Eco-Awareness Camps conducting with following objectives:

1. Create Awareness to the local people regarding ecological impotents of birds and the wetland with the role of our eco system.
2. Educating, motivating and eliciting various components of bird sanctuary.
3. Sharing of knowledge about current forest policies and conservation issues.
4. Scientific management of Udayamarthandapuram Lake with the participation of local communities and line agencies.

14.2.5. Eco-Development Work

The following existing facilities are available for the tourists while visiting the sanctuary. Bird walk area (1.5 km) to see birds and two watch towers are present in the sanctuary area. The tank bund can be converted into a nature trail this can be done by strengthening the bund, clearing bushes and erecting interpretation signboards along the trail. Recently an interpretation centre is developed for creating awareness among the visitors. A few cement benches are present on the tank bund for the tourists to sit and watch the birds. Interpretation boards have been placed at strategic places explaining the importance of the sanctuary, importance of birds. For satisfying the information needs of the visitors to the sanctuary, pamphlets and posters needs to be prepared. Students and local people must be made aware about the importance of wildlife conservation.

14.2.6. Eco-Tourism

The sanctuary is open for visitors throughout the year and tourists can visit the sanctuary without paying any fee. Every year 1500-2500 tourists arrive at Udayamarthandapuram. Tourism is high in the month of Nov-Feb and low in the month of May-Sep. The best time to visit the Sanctuary is November-February. Several migratory water birds come to the Sanctuary in January. There are six watch towers and one elevated bund around the wetland for observing birds. Signage have been put up near the sanctuary for information on water birds. People can walk easily on elevated bund which provides a good view for bird watching. Binoculars are available for the visitors at sanctuary under the safe custody of forest guard.

14.3. Non- Recurring expenditure

Budget Fore Casting Non –recurring

Sl. No.	Name of the Component	Recurring / non recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
1	Providing revetment arrangements in the boundaries of the sanctuary	Non recurring	500 RM	27.98	500 RM	29.00	300 RM	18.30	300 RM	19.50	200 RM	13.60
2	Providing paver block in path way	Non recurring	500 RM	18.07	500 RM	19.50	300 RM	12.60	300 RM	13.50	300 RM	15.00
3	Deepening and strengthening of existing sanctuary water logging areas	Non recurring	3000 M3	5.40	3000 M3	5.70	2500 M3	5.25	2500 M3	6.25	2500 M3	7.00
4	Formation of Smaller Bunds and Island Formation	Non recurring	10 Nos	1.50	-	-	10 Nos	1.70	-	-	10 Nos	1.70
5	Planting of bamboo saplings	Non recurring	500 Nos	0.25	-		500 Nos	0.30	-	-	500 Nos	0.35

Sl. No.	Name of the Component	Recurring / non recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
6	Construction of RCC watch tower	Non recurring	1 No	10.00	-	-	-	-	-	-	-	-
7	Construction of Anti-poaching shed	Non recurring	1 No.	4.00	-	-	-	-	-	-	-	-
8	Providing current consumption LED lamps with necessary fitting arrangement	Non recurring	5 Nos	3.00	-	-	-	-	-	-	5 Nos	4.00
9	Improvement of existing watch towers	Non recurring	LS	2.00	-	-	-	-	-	-	LS	2.50
10	Purchase of Binoculars and spotting scope for bird watching	Non recurring	LS	2.00	-	-	-	-	-	-	LS	2.00
11	Improvement of existing entrance	Non recurring	1 No	10.00	-	-	-	-	-	-	-	-

Sl. No.	Name of the Component	Recurring / non recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
12	Providing drinking water facilities for the tourists with proper pipe line in the bird walk area	Non recurring	LS	2.00	-	-	-	-	-	-	LS	1.00
13	Maintenance of existing buildings (FG quarters and visitors shed)	Non recurring	2 Nos.	15.00	-	-	-	-	-	-	-	-
14	Construction of protection wall all around the sanctuary	Non recurring	100 RM	4.50	100 RM	5.25	100 RM	6.00	100 RM	7.00	200 RM	15.00
15	Erection of signage's	Non recurring	2 Nos.	1.00	2 Nos.	1.06	2 Nos.	1.10	2 Nos.	1.14	2 Nos.	1.18
16	Eco bird voice along the natural trail	Non recurring	LS	2.00	_	_	_	_	_	_	LS	2.00

Sl. No.	Name of the Component	Recurring / non recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
17	Training bird identification centre for youth	Non recurring	LS	1.00	-	-	-	-	-	-	-	-
18	Periodical monitoring and evaluation of Eco Tourism and Report Preparation	Non recurring	LS	0.50	-	-	-	-	-	-	-	-
19	Display boards of critically endangered birds	Non recurring	20 Nos	4.00	-	-	10 Nos	2.50	-	-	15 Nos	3.30
20	Establishment of Eco friendly shed	Non recurring	1 No	3.00	-	-	-	-	-	-	-	-
21	Wooden Eco Sheds for visitors (Umbrella Structure) (2 Nos) with proper facilities in bird walk areas	Non recurring	2 Nos	3.00	-	-	2 Nos	5.00	-	-	2 Nos	6.00

Sl. No.	Name of the Component	Recurring / non recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
22	Maintenance of existing pathway	Non recurring	200 Rm	3.00	-	-	200 RM	3.50	-	-	200 RM	4.00
23	Establishment of dust pins with slogans along the bird walk	Non recurring	10 Nos	5.00	-	-	-	-	-	-	-	-
Total				**128.20**		**60.51**		**56.25**		**47.39**		**78.63**

14.4. Recurring expenditure

Budget Fore Casting Recurring

Sl. No.	Name of the Component	Recurring / non-recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
1	Eradication un wanted weeds	Recurring	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00
2	De-silting and cleaning the water channels	Recurring	3000 RM	2.10	-	-	3000 RM	2.40	-	-	3000 RM	2.70
3	Engaging Anti-poaching watchers	Recurring	7 Nos	6.30	7 Nos	7.00	7 Nos.	7.50	7 Nos.	8.20	7 Nos.	8.75
4	Training programme for field staff/line agencies/ ETC/EDC on capacity and skill development	Recurring	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00
5	Conducting Eco-Camps to students, Public etc.,	Recurring	5 camps	0.75	5 camps	1.00	5 camps	1.10	5 camps	1.20	5 camps	1.25

Sl. No.	Name of the Component	Recurring / non-recurring	2016-17		2017-18		2018-19		2019-20		2020-21	
			Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt	Qty.	Amt
6	Printing publicity materials of stickers, pamphlets etc.,	Recurring	LS	2.50	LS	2.50	LS	2.50	LS	2.50	LS	2.50
7	Clearing natural trail	Recurring	1500 RM	0.50	-	-	1500 RM	0.75	-	-	1500 RM	1.00
8	Engaging of Eco-Guide	Recurring	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62	2 Nos	1.62
9	Conducting bird census	Recurring	1 No	0.50	1 NO	0.60	1 No	0.65	1 No.	0.70	1 No	0.75
10	Engaging a biologist	Recurring	1 No.	2.16	1 No.	2.16	1 No.	2.16	1 No.	2.40	1 No.	2.40
	Total			**20.43**		**18.88**		**22.68**		**20.62**		**24.97**

14.5. **Revenue Realised During Previous years**- NIL--

14.6**. Revenue expected (Indicative)**- NIL --

14.7. **Fund Flow**

Fund for carrying out the prescription of this Management Plan will be secured Centrally Sponsored/Shared Schemes of the Government of India which are likely to be continued in the XIII plan. Support of funding that may be possible by other agencies like Dept. of Environment, CSR and others will be attempted to be secured and works implemented keeping the broad strategies/prescription highlighted in this Management Plan.

Annexure

TABLE1: Checklist of Birds in Udayamarthandapuram Birds Sanctuary.

Residential Water Birds:

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
1	Great Cormorant	*Phalacrocorax carbo*	Least Concern	R	R	Swimming, diving, basking. Open water, stumps/rocks, trees	Mainly fish
2	Purple Heron	*Ardea purpurea*	Least Concern	R	R	Shore-bird, wades in shallow water in proximity of reeds and tall aquatic vegetation. Trees, Pandanus thickets.	Fish, frogs and aquatic invertebrates. Small rodents.
3	Little Green Heron	*Butorides striatus*	Least Concern	R	R	Small wetlands in low-lying areas. The species is most conspicuous during dusk and dawn, nocturnal rather than diurnal, preferring to retreat to sheltered areas in daytime. They feed actively during the day.	small fish, frogs and aquaticarthropods, animals like leeches and mice.
4	Yellow Bittern	*Ixobrychus sinensis*	Least Concern	R	R	Shy shore-bird. Tall reeds and grass in shallow water.	Fish, frogs & aquatic invertebrates.
5	Chestnut Bittern	*Ixobrychus cinnamomeus*	Least Concern	R	R	Shy shore-bird. Tall reeds and grass in shallow water.	Insects, fish and amphibians
6	Black Bittern	*Dupetor flavicollis*	Least Concern	R	R	Shy shore-bird. Tall reeds and grass in shallow water.	Insects, fish and amphibians
7	Painted Stork	*Mycteria leucocephala*	Near Threatened	U	R	Shore-bird, wading in shallow water. Open water, water-logged grass. Trees.	Mainly fish. Reptiles, frogs & aquatic invertebrates.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
8	Comb Duck	*Sarkidiornis melanotos*	Least Concern	R	R	Jheels with reed and floating vegetation interspersed with patch of open water. Walks and perches freely on boughs of trees.	Grains and wild or cultivated rice and other vegetable matter. Occasionally frogs, aquatic insects etc.
9	Spot-billed Duck	*Anas poecilorhyncha*	Least Concern	U	R	Non-diving duck. Swimming & up-ending. Shallow, open water. Floating vegetation & reeds. Rocks & mud-banks.	Mainly aquatic vegetation and seeds. Aquatic invertebrates occasional.

Residential Wetland Breeding Birds:

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
1	Little Grebe	*Tachybaptus ruficollis*	Least Concern	C	R, B	Swimming, diving. Open water, floating vegetation	Fish, frogs, small aquatic invertebrates
2	Little Cormorant	*Phalacrocorax niger*	Least Concern	C	R, B	Swimming, diving, basking. Open water, stumps/rocks, trees	Mainly fish
3	Darter	*Anhinga melanogaster*	Near Threatened	C	R, B	Swimming, diving, basking. Open water, stumps/rocks, trees	Mainly fish
4	Little Egret	*Egretta garzetta*	Least Concern	C	R, B	Shore-bird, wades in shallow water. Stumps, rocks, water-logged grass & trees.	Fish, frogs and aquatic invertebrates
5	Grey Heron	*Ardea cinerea*	Least Concern	U	R, B	Shore-bird, wades in shallow water. Stumps, rocks, water-logged grass & trees.	Fish, frogs and aquatic invertebrates. Small rodents.
6	Median Egret	*Mesophoyx intermedia*	Least Concern	C	R, B	Shore-bird, wades in shallow water. Stumps, rocks, water-logged grass & trees.	Fish, frogs and aquatic invertebrates
7	Cattle Egret	*Bubulcus ibis*	Least Concern	M	R, B	Ground-bird. Meadows, water-logged grass. Thickets and trees.	Insects.
8	Indian Pond-Heron	*Ardeola grayii*	Least Concern	C	R, B	Shore-bird. Shallow water, water-logged grass & trees.	Fish, frogs & aquatic invertebrates.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
9	Little Green Heron	*Butorides striatus*	Least Concern	R	R	Small wetlands in low-lying areas. The species is most conspicuous during dusk and dawn, nocturnal rather than diurnal, preferring to retreat to sheltered areas in daytime. They feed actively during the day.	small fish, frogs and aquaticarthropods, animals like leeches and mice.
10	Asian Openbill-Stork	*Anastomus oscitans*	Least Concern	M	R, B	Shore-bird, wading in shallow water. Open water, water-logged grass. Trees.	Mainly snails. Frogs, crabs and other aquatic invertebrates.
11	Oriental White Ibis	*Threskiornis melanocephalus*	Near Threatened	M	R,B	Shore-bird, wading in shallow water. Open water, water-logged grass. Trees.	Fish, frogs & aquatic invertebrates.

Migratory Water Birds:

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
1	Cotton Teal	*Nettapus coromandelianus*	Least Concern	U	M	Still freshwater lakes (jheels), rain-filled ditches, inundated paddy fields, irrigation tanks, etc.	Seeds and vegetable matter, especially water lilies; also insects, crustaceans
2	Northern Shoveller	*Anas clypeata*	Least Concern	R	M	Non-diving duck. Swimming & up-ending. Shallow, open water. Floating vegetation & reeds. Rocks and mud-banks. Non-breeding winter migrant.	Submerged aquatic plants. Rice. Seeds. Aquatic invertebrates.
3	Northern Pintail	*Anas acuta*	Least Concern	U	M	Non-diving duck. Swimming & up-ending. Shallow, open water. Floating vegetation & reeds. Rocks and mud-banks. Non-breeding winter migrant.	Submerged aquatic plants. Rice. Seeds. Aquatic invertebrates.
4	Common Teal	*Anas crecca*	Least Concern	R	M	Non-diving duck. Swimming & up-ending. Shallow, open water. Floating vegetation & reeds. Rocks & mud-banks. Non-breeding winter migrant.	Submerged aquatic plants. Rice. Seeds. Aquatic invertebrates.
5	Garganey	*Anas querquedula*	Least Concern	U	M	Non-diving duck. Swimming & up-ending. Shallow, open water. Floating vegetation & reeds. Rocks and mud-banks. Non-breeding winter migrant.	Submerged aquatic plants. Rice. Seeds. Aquatic invertebrates.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
6	Eurasian Wigeon	*Anas Penelope*	Least Concern	R	M	Open wetlands, such as wet grassland or marshes with some taller vegetation, and usually feeds by dabbling for plant food or grazing, which it does very readily.	Submerged aquatic plants. Rice. Seeds. Aquatic invertebrates.
7	Western Marsh-Harrier	*Circus aeruginosus*	Least Concern	R	M	Hunting predator. Open water, reeds and floating vegetation. Non-breeding winter migrant.	Wetland birds. Fish, frogs, mice & large insects.
8	Common Snipe	*Gallinago _allinago*	Least Concern	R	M	Wading shore-bird. Wet grass, water-logged reed-beds. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.
9	Common Redshank	*Tringa tetanus*	Least Concern	R	M	Wading shore-birds. Wet mud-flats. Shallow puddles. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.
10	Common Greenshank	*Tringa nebularia*	Least Concern	R	M	Wading shore-birds. Wet mud-flats. Shallow puddles. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.
11	Wood Sandpiper	*Tringa glareola*	Least Concern	U	M	Wading shore-birds. Wet mud-flats. Shallow puddles. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.
12	Little Stint	*Calidris minuta*	Least Concern	R	M	Wading shore-birds. Wet mud-flats. Shallow puddles. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.
13	Ruff	*Philomachus pugnax*	Least Concern	U	M	Wading shore-birds. Wet mud-flats. Shallow puddles. Non-breeding winter migrant.	Worms, larvae and other soil invertebrates.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
14	Eurasian Curlew	*Numenius arquata*	Least Concern	R	M	The species breeds on upland moors, peat bogs, swampy and dry heathlands, fens, open grassy or boggy areas in forests, damp grasslands, meadows	annelid worms and terrestrial insects, crustaceans, molluscs, polychaete worms, spiders, berries and seeds, occasionally small fish, amphibians, lizards, young birds and small rodents.
15	Whimbrel	*Numenius phaeopus*	Least Concern	R	M	It breeds from May to August.	Crustaceans, molluscs, large polychaete worms and occasionally fish
16	Oriental Pratincole	*Glareola maldivarum*	Least Concern	U	M	Treeless, open and sparse wooded plains, grasslands, claypans. Margins of wetlands, creeks, river beds, bore drains, lagoons, springs, claypans and sewage farms.	Insects, spiders and centipedes
17	Small Pratincole	*Glareola lacteal*	Least Concern	U	M	Usually in arid and semi-arid rainfall zones. They are also sometimes found around the margins of wetlands.	Insects, spiders and centipedes
18	Gull-billed Tern	*Gelochelidon nilotica*	Least Concern	R	M	River,Lakes and coastal areas	Insects, Fishes, and other small aquatic animals
19	Little Tern	*Sterna albifrons*	Least Concern	R	M	River,Lakes and coastal areas	Insects, Fishes, and other small aquatic animals
20	Whiskered Tern	*Chlidonias hybridus*	Least Concern	U	M	River,Lakes and coastal areas	Insects, Fishes, and other small aquatic animals

Migratory wetland breeding birds:

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
1	Large Egret	*Casmerodius albus*	Least Concern	C	R,B/M	Shore-bird, wades in shallow water. Stumps, rocks, water-logged grass & trees.	Fish, frogs and aquatic invertebrates
2	Glossy Ibis	*Plegadis falcinellus*	_	M	R, B/M	Shore-bird, wading in shallow water. Open water, water-logged grass. Trees.	Mainly fish. Reptiles, frogs & aquatic invertebrates.
3	Common Coot	*Fulica atra*	Least Concern	C	R, B/M	Swimming bird. Open water. Marsh with grass and reeds. Floating vegetation.	Aquatic plants, seeds. Insects and other aquatic invertebrates.

Terrestrial Birds:

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
1	Blue Rock Pigeon	*Columba livia*	Least Concern	C	R, B	Ground-feeding birds. Dry sand beds, short-grass meadows. Built spaces.	Grains and seeds.
2	Little Brown Dove	*Streptopelia senegalensis*	Least Concern	C	R, B	Ground-feeding birds. Dry sand beds, short-grass meadows. Trees.	Grains and seeds.
3	Spotted Dove	*Streptopelia chinensis*	Least Concern	C	R, B	Ground-feeding birds. Dry sand beds, short-grass meadows. Trees.	Grains and seeds.
4	Eurasian Collared-Dove	*Streptopelia decaocto*	Least Concern	C	R, B	Ground-feeding birds. Dry sand beds, short-grass meadows. Trees.	Grains and seeds.
5	Rose-ringed Parakeet	*Psittacula krameri*	Least Concern	C	R, B	Arboreal birds. Trees.	Fruits. Seeds & nectar.
6	Pied Crested Cuckoo	*Clamator jacobinus*	Least Concern	R	R, B	Arboreal birds. Trees. Thickets. Parasitic breeders. Presence of host birds – Babblers.	Fruits, insects.
7	Brainfever Bird	*Hierococcyx varius*	Least Concern	U	R, B	Arboreal birds. Trees. Thickets. Parasitic breeders. Presence of host birds – Babblers.	Fruits, insects.
8	Indian Plaintive Cuckoo	*Cacomantis passerinus*	_	R	P	Arboreal birds. Trees. Thickets. Parasitic breeders. Presence of host birds – Tailorbird.	Fruits, insects.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
9	Asian Koel	*Eudynamys scolopacea*	Least Concern	C	R, B	Arboreal birds. Trees. Thickets. Parasitic breeders. Presence of host birds – Crows.	Fruits, insects.
10	Small Green-billed Malkoha	*Phaenicophaeus viridirostris*	_	U	R, B	Bush-dwelling birds. Nesting non-parasitic cuckoo. Thickets. Euphorbia (kalli) shrubs.	Large insects and small reptiles.
11	Greater Coucal	*Centropus sinensis*	Least Concern	U	R, B	Bush-dwelling birds. Nesting non-parasitic cuckoo. Thickets. Euphorbia (kalli) shrubs.	Large insects and small reptiles. Bird eggs and chicks.
12	Barn Owl	*Tyto alba*	_	R	R, B	Nocturnal predator. Built spaces.	Rodents. Small birds.
13	Spotted Owlet	*Athene brama*	Least Concern	C	R, B	Nocturnal predator. Built spaces. Dead tree. Tall trees.	Insects, frogs and small lizards.
14	Nightjars	Caprimulgidae					
15	Indian Jungle Nightjar	*Caprimulgus indicus*	_	R	R,B	Ground-nesting nocturnal birds. Shrubs and thickets. Rocks.	Flying insects.
16	Common Indian Nightjar	*Caprimulgus asiaticus*	_	R	R, B	Ground-nesting nocturnal birds. Shrubs and thickets. Rocks.	Flying insects.
17	Asian Palm-Swift	*Cypsiurus balasiensis*	Least Concern	C	R, B	Aerial insect-eating birds. Palms – Palmyra.	Flying insects and midges.
18	House Swift	*Apus affinis*	Least Concern	R	R	Aerial insect-eating birds. Built spaces.	Flying insects and midges.
19	Small Blue Kingfisher	*Alcedo atthis*	Least Concern	U	R, B	Small hunting birds. Shallow water with stumps and perches. Mud-banks for nesting.	Fish and aquatic insects.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
20	White-breasted Kingfisher	*Halcyon smyrnensis*	Least Concern	U	R,B	Hunting birds. Grass meadows. Shallow water with stumps and perches. Dead trees and mud-banks for nesting.	Fish, frogs, lizards, small snakes and insects.
21	Lesser Pied Kingfisher	*Ceryle rudis*	Least Concern	R	R	Fishing birds. Open water. Perches. Earth banks for nesting.	Fish.
22	Small Bee-eater	*Merops orientalis*	Least Concern	C	R,B	Arboreal insect-eating birds. Trees. Low perches. Earth-banks for nesting.	Flying insects.
23	Blue-tailed Bee-eater	*Merops philippinus*	Least Concern	C	M	Arboreal insect-eating birds. Trees. Low perches. Earth-banks for nesting.	Flying insects.
24	Indian Roller	*Coracias benghalensis*	Least Concern	R	R,B	Arboreal hole-nesting birds that feed on ground. Trees. Perches. Old trees and palms for nesting.	Insects. Small vertebrates.
25	Common Hoopoe	*Upupa epops*	Least Concern	R	R,B	Ground-feeding hole-nesting bird. Trees. Built spaces.	Soil insects.
26	Brown-headed Barbet	*Megalaima zeylanica*	Least Concern	R	R	Found in evergreen, semi-evergreen, and in deciduous forest, They mostly communicate with loud calls.	Mainly Fig fruits and other small fruits, insects
27	Coppersmith Barbet	*Megalaima haemacephala*	Least Concern	R	R	Arboreal hole-nesting birds. Trees.	Fruit
28	Lesser Golden-backed Woodpecker	*Dinopium benghalense*	_	U	R,B	Arboreal hole-nesting birds. Trees. Dead trunks and branches.	Insects. Fruits and nectar.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
29	Indian Pitta	*Pitta brachyura*	_	C	P	Non-breeding ground bird. Winter migrant. Trees. Thickets.	Soil invertebrates.
30	Ashy-crowned Sparrow-Lark	*Eremopterix grisea*	Least Concern	C	R	Small ground-dwelling birds. Grass meadows. Low perches.	Grass seeds and soil insects.
31	Eurasian Skylark	*Alauda arvensis*	_	R	R	Small ground-dwelling birds. Grass meadows. Low perches.	Grass seeds and soil insects.
32	Eastern Skylark	*Alauda gulgula*	Least Concern	R	R	Small ground-dwelling birds. Grass meadows. Low perches.	Grass seeds and soil insects.
33	Common Swallow	*Hirundo rustica*	Least Concern	C	M	Non-breeding aerial feeding bird. Winter migrant. Bare trees, overhead lines, fences.	Flying insects.
34	Red-rumped Swallow	*Hirundo daurica*	Least Concern	R	M	Aerial feeding birds. Nesting in buildings and bridges.	Flying insects.
35	Forest Wagtail	*Dendronanthus indicus*	_	U	P	Ground-feeding non-breeding winter migrants. Wet grass and shallow pools.	Insects.
36	Large Pied Wagtail	*Motacilla maderaspatensis*	Least Concern	U	R,B	Ground-feeding birds. Meadows and moist soil. Rocks, walls and culverts for nesting.	Insects.
37	Yellow Wagtail	*Motacilla flava*	Least Concern	R	M	Ground-feeding non-breeding winter migrants. Wet grass and shallow pools.	Insects.
38	Richard's Pipit	*Anthus richardi*	Least Concern	R	R	Ground-feeding non-breeding winter migrants. Wet grass and shallow pools.	Insects.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
39	Paddyfield Pipit	*Anthus rufulus*	Least Concern	R	R	Ground-feeding birds. Short-grass meadows.	Insects. Grass seeds.
40	Black-headed Cuckoo-Shrike	*Coracina melanoptera*	_	R	P	Arboreal birds. Trees, thickets.	Insects. Small fruits.
41	Common Woodshrike	*Tephrodornis pondicerianus*	_	R	R	Arboreal birds. Trees, thickets.	Insects.
42	Red-vented Bulbul	*Pycnonotus cafer*	Least Concern	C	R,B	Arboreal birds. Thickets, trees.	Insects. Small fruits.
43	White-browed Bulbul	*Pycnonotus luteolus*	Least Concern	C	R,B	Arboreal birds. Thickets, trees.	Insects. Small fruits.
44	Orange-headed Thrush	*Zoothera citrina*	_	R	M		
45	Oriental Magpie-Robin	*Copsychus saularis*	Least Concern	R	R	Ground-feeding arboreal birds. Trees, thicket. Meadows and scrub. Built spaces.	Insects.
46	Indian Robin	*Saxicoloides fulicata*	Least Concern	R	R,B	Ground-feeding arboreal birds. Trees, thicket. Meadows and scrub. Built spaces.	Insects.
47	Common Babbler	*Turdoides caudatus*	_	R	R,B	Dry-deciduous, scrub jungles	Insects, Small fruits, Nectar.
48	White-headed Babbler	*Turdoides affinis*	_	C	R,B	Ground-feeding arboreal birds. Trees, thickets. Scrub.	Insects. Small fruits. Nectar. Small lizards.
49	Ashy Prinia	*Prinia socialis*	_	R	R,B	Bush-dwelling birds. Scrub. Thickets. Tall grass.	Insects.
50	Plain prinia	*Prinia inornata*	Least Concern	R	R, B	Bush-dwelling birds. Scrub. Thickets. Tall grass. Non-breeding winter migrant.	Insects.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
51	Blyth's Reed-Warbler	*Acrocephalus dumetorum*	Least Concern	C	M	Bush-dwelling birds. Scrub. Thickets. Tall grass. Non-breeding winter migrant.	Insects.
52	Common Tailorbird	*Orthotomus sutorius*	_	C	R,B	Canopy and bush-dwelling birds. Scrub. Thickets. Tall grass. Trees.	Insects.
53	Greenish Leaf-Warbler	*Phylloscopus trochiloides*	Least Concern	C	P	Canopy-dwelling non-breeding winter migrants. Trees.	Insects.
54	Large-billed Leaf-Warbler	*Phylloscopus magnirostris*	_	R	M		
55	Thick-billed Warbler	*Acrocephalus aedon*	Least Concern	R	M		
56	Common Lesser Whitethroat	*Sylvia curruca*	_	R	M		
57	Flycatchers	Muscicapinae					
58	Asian Brown Flycatcher	*Muscicapa dauurica*	_	R	P	Arboreal birds. Trees. Thickets.	Insects.
59	Brown-breasted Flycatcher	*Muscicapa muttui*	_	R	P	Non-breeding arboreal winter migrants. Trees. Thickets.	Insects.
60	Asian Paradise-Flycatcher	*Terpsiphone paradisi*	_	C	M	Arboreal non-breeding migrants. Trees. Thickets.	Insects.
61	Purple-rumped Sunbird	*Nectarinia zeylonica*	Least Concern	U	R,B	Arboreal birds. Trees, thickets.	Nectar. Insects.
62	Purple Sunbird	*Nectarinia asiatica*	_	U	R,B	Arboreal birds. Trees, thickets.	Nectar. Insects.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
63	White-throated Munia	*Lonchura malabarica*	_	C	R	Arboreal ground-feeding birds. Thickets. Scrub.	Seeds and grains.
64	Spotted Munia	*Lonchura punctulata*	_	U	R	Arboreal ground-feeding birds. Thickets. Scrub.	Seeds and grains.
65	Black-headed Munia	*Lonchura malacca*	_	R	R	Arboreal ground-feeding birds. Thickets. Scrub. Grass and reeds.	Seeds and grains.
66	House Sparrow	*Passer domesticus*	Least Concern	U	R,B	Arboreal ground-feeding birds. Built spaces. Trees. Grass meadows. Fallows.	Grains. Insects.
67	Yellow-throated Sparrow	*Petronia xanthocollis*	_	R	R	Arboreal ground-feeding birds. Built spaces. Trees. Grass meadows. Fallows.	Grains. Insects.
68	Baya Weaver	*Ploceus philippinus*	Least Concern	R	R	Arboreal ground-feeding birds. Palms (Date, Palmyra). Open wells.	Grains. Insects.
69	Grey-headed Starling	*Sturnus malabaricus*	_	C	M	Arboreal ground-feeding birds. Trees. Meadows.	Insects. Small fruits. Nectar.
70	Brahminy Starling	*Sturnus pagodarum*	_	C	M	Arboreal ground-feeding birds. Trees. Meadows.	Insects. Small fruits. Nectar.
71	Common Myna	*Acridotheres tristis*	Least Concern	C	R,B	Arboreal ground-feeding birds. Trees. Built spaces. Meadows.	Insects. Small lizards. Fruits. Nectar.
72	Rosy Starling	*Sturnus roseus*	Least Concern	C	M	Arboreal birds. Non-breeding winter migrants. Trees. Crops.	Seeds. Nectar.

S. NO	Common Name	Scientific Name	Conservation Status	Status in Sanctuary	Migratory Status	Habit & Habitat (feeding, resting & nesting)	Food requirement
73	Eurasian Golden Oriole	*Oriolus oriolus*	Least Concern	R	M	Arboreal non-breeding winter migrant. Trees.	Insects. Nectar.
74	Black Drongo	*Dicrurus macrocercus*	Least Concern	C	R,B	Arboreal birds. Trees. Stumps. Fallows.	Insects. Nectar.
75	Ashy Drongo	*Dicrurus leucophaeus*	_	R	M	Arboreal non-breeding winter migrant. Trees.	Nectar. Insects.
76	Ashy Woodswallow	*Artamus fuscus*	_	R	R	Arboreal aerial feeding birds. Trees. Palmyra palms.	Insects.
77	Indian Treepie	*Dendrocitta vagabunda*	Least Concern	U	R,B	Arboreal birds. Trees.	Fruits. Insects. Eggs and chicks of birds.
78	House Crow	*Corvus splendens*	Least Concern	M	R,B	Arboreal birds. Trees. Built spaces.	Human wastes. Insects. Fruits. Eggs and chicks of birds. Other small vertebrates. Carcass.
79	Jungle Crow	*Corvus macrorhynchos*	Least Concern	C	R,B	Arboreal birds. Trees. Built spaces.	Human wastes. Insects. Fruits. Eggs and chicks of birds. Other small vertebrates. Carcass.

Key: Status in Sanctuary

A: Abundant, M: Most Common, C: Common, U: Uncommon, R: Rare, H: Historical records, V: Vagrant

Status	Near-Threatened	Least-Concerned
Abundant	>1000	>5000
Most-Common	>500	>1000
Common	50-500	100-1000
Un-common	10-50	10-100
Rare	<10	<10

Migratory Status

R: Resident, M: Migratory, P: Passage Migrant, B: Breeding

Flora of Udhayamarthandapuram Birds Sanctuary.

S.No	Family	Species	Tamil Name
1	Acanthaceae	***Asystasia gangetica*** (L.) T. And.	
2	Acanthaceae	***Hygrophila schulli*** (Hamilt.) M.R.Almeida	Neermulli
3	Acanthaceae	***Justicia tranquebariensis*** L.f.	Thavasi murungai
4	Alangiaceae	***Alangium salvifolium*** (L.f.) Wang.	Azhinjil
5	Amaranthaceae	***Achyranthes aspera*** L.	Nayurivi
6	Amaranthaceae	***Aerva lanata*** (L.) Juss. ex Schultes	Peelai, Sirupeelai
7	Amaranthaceae	***Alternanthera paronychioides*** A.St.	
8	Amaranthaceae	***Alternanthera sessilis*** (L.) R.Br. ex DC.	Ponnanganni
9	Amaranthaceae	***Alternanthera tenella*** Colla.	
10	Amaranthaceae	***Digera muricata*** (L.) Mart.	Thoyya keerai
11	Amaranthaceae	***Gomphrena globosa*** L.	Vaadamalli
12	Amaranthaceae	***Gomphrena serrata*** L.	
13	Anacardiaceae	***Lannea coromandelica*** (Houtt.) Merr.	Odhiya maram, Aanaikkaarai
14	Annonaceae	***Polyalthia longifolia*** (Sonner.) Thw.	Asogam, Nettilingam
15	Apiaceae	***Centella asiatica*** (L.) Urban	Vallarai
16	Apocynaceae	***Carissa spinarum*** L.	Sirukala
17	Apocynaceae	***Nerium oleander*** L.	Karaviram, Sevvarali
18	Apocynaceae	***Wrightia tinctoria*** (Roxb.) R.Br.	Nilapaalai, Vetpaalai

19	Aponogetonaceae	***Aponogeton natans*** (L.) Engler	Kottikkizhangu
20	Araceae	***Colocasia esculenta*** (L.) Schott	Saeppan/ karunai kizhangu
21	Arecaceae	***Borassus flabellifer*** L.	Panai
22	Arecaceae	***Phoenix pusilla*** Gaertn	Eechai
23	Arecaceae	***Phoenix sylvestris*** (L.) Roxb.	Periya eecham
24	Asclepiadaceae	***Calotropis gigantea*** (L.) R.Br.	Erukku
25	Asteraceae	***Parthenium hysterophorus*** L.	Mookthipoo
26	Asteraceae	***Tridax procumbens*** L.	Vettukkaaya-thazhai
27	Asteraceae	***Xanthium indicum*** Koen.	Marul oomatham
28	Boraginaceae	***Carmona retusa*** (Vahl) Masamune	Kuruvi Vettrilai
29	Cactaceae	***Opuntia vulgaris*** Mill.	Chappathikkalli
30	Caesalpiniaceae	***Senna auriculata*** (L.) Roxb.	Avaram, Avaarai
31	Caesalpiniaceae	***Senna occidentalis*** (L.) Link	Peiyavarai, Thagarai
32	Caesalpiniaceae	***Senna tora*** (L.) Roxb.	Oosi thagarai
33	Capparidaceae	***Cadaba fruticosa*** (L.) Druce	Kaatagathi, Vizhudhi
34	Capparidaceae	***Cleome viscosa*** L.	Nai kadugu, Nai vaelai
35	Ceratophyllaceae	***Ceratophyllum demersum*** L.	
36	Colchicaceae	***Gloriosa superba*** L.	Kalappakizhangu, Senkaandhal
37	Combretaceae	***Terminalia cuneata*** Roxb.	Vellai / Neer Marudhu
38	Commelinaceae	***Commelina benghalensis*** L.	Kanaangozhai
39	Commelinaceae	***Commelina diffusa*** Burm	
40	Commelinaceae	***Cyanotis axillaris*** (L.) D. Don	Vazhukaipul, Kaanangozhai

41	Convolvulaceae	***Cuscuta chinensis*** Lam.	Pathalamooli
42	Convolvulaceae	***Evolvulus alsinoides*** (L.) L.	Vishnukarandi
43	Convolvulaceae	***Evolvulus nummularius*** (L.) L.	
44	Convolvulaceae	***Ipomoea aquatica*** Forssk.	Vallakeerai, Neerkaatamani
45	Convolvulaceae	***Ipomoea carnea*** Jacq.	Neiveli katamani
46	Convolvulaceae	***Ipomoea sepiaria*** Koen.	
47	Convolvulaceae	***Merremia emarginata*** (Burm.f.) Hall.f.	Perettai/Yelikkaadhu Keerai
48	Cucurbitaceae	***Coccinia grandis*** (L.) Voigt	Kovai
49	Cucurbitaceae	***Mukia maderaspatana*** (L.) M. Roem.	Musumusukkai
50	Cyperaceae	***Cyperus arenarius*** Retz.	
51	Cyperaceae	***Cyperus difformis*** L.	
52	Cyperaceae	***Cyperus distans*** L.	
53	Cyperaceae	***Cyperus pangorei*** Rottb.	Paai korai
54	Cyperaceae	***Cyperus rotundus*** L.	Koraikizhanghu
55	Cyperaceae	***Fimbristylis dichotoma*** (L.) Vahl	
56	Cyperaceae	***Kyllingia nemoralis***(J. R. & G. Forst.) Dandy	
57	Cyperaceae	***Pycreus polystachyos*** (Rottboell) Beauv.	
58	Cyperaceae	***Pycreus pumilus*** (L.) Nees ex Clarke	
59	Cyperaceae	***Schoenoplectus articulatus*** (L.) Palla	
60	Euphorbiaceae	***Croton bonplandianum*** Baill.	Rail poondu
61	Euphorbiaceae	***Euphorbia hirta*** L.	Ammanpacharisi

62	Euphorbiaceae	***Flueggea leucopyrus*** Willd.	Pulanji
63	Euphorbiaceae	***Jatropha gossypifolia*** L.	Kaatu-amanakku
64	Euphorbiaceae	***Phyllanthus amarus*** Schum. & Thonn.	Kizha-nelli
65	Euphorbiaceae	***Phyllanthus reticulatus*** Poir.	Inki pazham
66	Euphorbiaceae	***Sebastiania chamaelea*** (L.) Muell.-Arg.	Eli-amanaku, Kuruvika
67	Euphorbiaceae	***Tragia involucrata*** L.	Chenthatti, Kaanjori
68	Fabaceae	***Abrus precatorius*** L.	Kundumani
69	Fabaceae	***Aeschynomene aspera*** L.	Attrunetti, Sadai, Thakkai
70	Fabaceae	***Alysicarpus monilifer*** (L.) DC.	
71	Fabaceae	***Clitoria ternatea*** L.	Kaarkataan, Sangu poo
72	Fabaceae	***Crotalaria hebecarpa*** (DC.) Rudd	
73	Fabaceae	***Crotalaria retusa*** L.	
74	Fabaceae	***Desmodium triflorum*** (L.) DC.	Sirupulladi
75	Fabaceae	***Indigofera aspalathoides***Vahl ex DC.	Sivanaar vaembu
76	Fabaceae	***Pongamia pinnata*** (L.) Pierre	Punga maram
77	Fabaceae	***Rhynchosia aurea*** (Willd.) DC.	
78	Fabaceae	***Tephrosia purpurea*** (L.) Pers.	Kozhinji, Kollukaai vaelai
79	Fabaceae	***Trigonella foenum-graecum*** L.	
80	Hydrocharitaceae	***Hydrilla verticillata*** (L. f.) Royle	
81	Hydrocharitaceae	***Vallisneria natans*** (Lour.) Hara	
82	Hydrophyllaceae	***Hydrolea zeylanica*** (L.) Vahl	Vellal

83	Lamiaceae	***Hyptis suaveolens*** (L.) Poit.	
84	Lamiaceae	***Leucas indica*** (L.) R.Br. ex Vatke	Thumbai
85	Lamiaceae	***Ocimum tenuiflorum*** L.	Thulasi
86	Lemnaceae	***Lemna perpusilla*** Torrey	Vaathuppaasi
87	Lemnaceae	***Spirodela polyrhiza*** (L.) Schleiden	Vaathuppaasi
88	Lythraceae	***Ammania baccifera*** L.	Neermel-neruppu, Kallurvi
89	Malvaceae	***Abutilon indicum*** (L.) Sweet	Thuthi, Nalla thuthi
90	Malvaceae	***Pavonia odorata*** Willd.	Peramutti, Aavibattam
91	Malvaceae	***Thespesia populnea*** (L.) Soland ex Correa	Poovarasu
92	Malvaceae	***Urena lobata*** L.	Ottatthi, Ottu thuthi
93	Martyniaceae	***Martynia annua*** L.	Thael Kodukku
94	Meliaceae	***Azadirachta indica*** A. Juss.	Vaembu, Vaeppam
95	Menispermaceae	***Pachygone ovata*** (Poir.) Miers	Siru Kattukodi
96	Menispermaceae	***Tinospora cordifolia*** (Willd.) Miers	Seendhil
97	Menyanthaceae	***Nymphoides hydrophylla*** (Lour.) Kuntze	
98	Mimosaceae	***Acacia nilotica*** (L.) Willd. ex Del.	Karuvelam
99	Mimosaceae	***Albizia saman*** (Jacq.) F.v. Muell.	Thoongu moonji
100	Mimosaceae	***Leucaena leucocephala*** (L.) Gills	Soundil, Joundil
101	Mimosaceae	***Neptunia prostrata*** (Lam.) Baill.	Sadai Sundaikkeerai
102	Mimosaceae	***Pithecellobium dulce*** (Roxb.) Benth.	Kodukkaai puli
103	Mimosaceae	***Prosopis juliflora*** (Sw.) Dc.	Seemai mullu, Vaelikaruvai

104	Molluginaceae	***Glinus oppositifolius*** (L.) A. DC.	
105	Moraceae	***Ficus benghalensis*** L.	Aalamaram
106	Moraceae	***Ficus racemosa*** L.	Atthi, Vellaiatthi
107	Moraceae	***Ficus religiosa*** L.	Arasu
108	Moraceae	***Streblus asper*** Lour.	Kuruvipala, Pirasu
109	Nelumbonaceae	***Nelumbo nucifera*** Gaertn.	Tamarai, Ambal
110	Nyctaginaceae	***Boerhavia diffusa*** L.	Mookarattai
111	Nymphaeaceae	***Nymphaea pubescens*** Willd.	Alli
112	Nymphaeaceae	***Nymphaea rubra*** Roxb. ex Salisb.	Alli
113	Onagraceae	***Ludwigia adscendens*** (L.) Hara	
114	Onagraceae	***Ludwigia perennis*** L.	
115	Pedaliaceae	***Pedalium murex*** L.	Perunerunji, Yanai nerunji
116	Periplocaceae	***Hemidesmus indicus*** (L.) R.Br.	Nannaari
117	Poaceae	***Arundo donax*** L.	Korukkai, Southai moongil
118	Poaceae	***Bambusa bambos*** Voss	Moongil, Periya moongil
119	Poaceae	***Chloris barbata*** Sw.	Kodai Pullu, Sevarug pullu
120	Poaceae	***Cynodon dactylon*** (L.) Pers.	Arugam pullu
121	Poaceae	***Cyrtococcum trigonum*** (Retz.) A. Camus	
122	Poaceae	***Dichanthium annulatum*** (Forssk.) Stapf	
123	Poaceae	***Eragrostis japonica*** (Thunb.) Trin.	
124	Poaceae	***Eragrostis riparia*** (Willd.) Nees	

125	Poaceae	***Eragrostis viscosa*** (Retz.) Trin.	
126	Poaceae	***Perotis indica*** (L.) Kuntze	Narival pullu
127	Poaceae	***Saccharum spontaneum*** L.	Naanal, Dharbai
128	Poaceae	***Sporobolus indicus*** (L.) R. Br.	
129	Poaceae	***Vetiveria zizanioides*** (L.) Nash	Vettiver, Virkel, Vizhal
130	Polygonaceae	***Polygonum glabrum*** Willd.	Aattralari
131	Pontederiaceae	***Eichhornia crassipes*** (Mart.) Solms-Laub.	Agaaya thamarai
132	Rhamnaceae	***Ziziphus mauritiana*** Lam.	Illandhai
133	Rhamnaceae	***Ziziphus oenoplia*** (L.) Mill.	Soorai pazham
134	Rubiaceae	***Canthium coromandelicum*** (Burm. F.) Alston	Kaaraichedi, Nalla kaarai
135	Rubiaceae	***Hedyotis corymbosa*** (L.) Lam.	
136	Rubiaceae	***Morinda pubescens*** J.E. Smith	Manjanatti, Manjal nuna, Nuna
137	Rubiaceae	***Spermacoce hispida*** L.	Nathaichoori
138	Sapindaceae	***Cardiospermum halicacabum*** L.	Mudakotthan, Mudakkaruthaan
139	Sapotaceae	***Madhuca indica*** J. F. Gmel.	Illupai, Kaatu illuppai
140	Scrophulariaceae	***Bacopa monnieri*** (L.) Pennell	Neerbrahmi
141	Scrophulariaceae	***Limnophila indica*** (L.) Druce	
142	Scrophulariaceae	***Scoparia dulcis*** L.	Sarakkotthini, Sarkarai vaembu
143	Solanaceae	***Datura innoxia*** Mill.	Oomatthai
144	Solanaceae	***Solanum trilobatum*** L.	Thoodhuvalai
145	Solanaceae	***Solanum virginianum*** L.	Kandankathiri
146	Tiliaceae	***Corchorus aestuans*** L.	Pinaaku poondu/keerai
147	Typhaceae	***Typha angustifolia*** L.	Sambu, Jambu

148	Ulmaceae	***Holoptelea integrifolia*** (Roxb.) Planch.	Aya, Ayil, Aavimaram
149	Verbenaceae	***Gmelina asiatica*** L.	Nilakkumizh, Mulkumizh
150	Verbenaceae	***Phyla nodiflora*** (L.) Greene	Poduthalai
151	Verbenaceae	***Stachytarpheta jamaicensis*** (L.) Vahl	Seemai nayuruvi
152	Vitaceae	***Cayratia pedata*** (Lam.) Juss.	Kaattu pirandai, naralai
153	Vitaceae	***Cissus quadrangularis*** L.	Pirandai
154	Zygophyllaceae	***Tribulus lanuginosis*** L.	Nerunji, Sirunerinji

List of Mammals in Udhayamarthandapuram Birds Sanctuary.

S. No	Name of Animals	Scientific Names
1	Indian Grey Mongoose	*Herpestes edwardsii*
2	Three striped palm Squirrel	*Funambulus palmarum*
3	Indian flying fox	*Pteropus giganteus*
4	Golden Jackal	*Canis aureus*
5	Jungle Cat	*Felis chaus*
6	Domestic Cow	*Bos Taurus*
7	Goat	*Capra aegagrus hircus*
8	Domestic Buffalo	*Bubalus bubalis*

List of Reptiles in Udhayamarthandapuram Birds Sanctuary.

S. No	Name of Animals	Scientific Names
1	House Gecko	*Hemidactylus frenatus*
2	Spotted Indian Gecko	*Hemidactylus brookii*
3	Garden lizard	*Calotes versicolor*
4	Green lizard	*Calotes calotes*
5	Monitor lizard	*Varanus bengalensis*
6	Common Indian Skink	*Eutrophis carinata*
7	Olive keelback	*Atretium schistosum*
8	Checkered keelback	*Xenochrophis piscator*
9	Broze backed tree snake	*Dendrelaphis tristis*

List of buildings in Udayamarthandapuram Bird Sanctuary

Sl. No.	Name of buildings
1.	Single Forest Guard Quarters
2.	Single Anti-poaching watcher Quarters
3.	Latrine for women
4.	Latrine for men
5.	Motor Pumpset room
6.	Overhead tank
7.	Watch tower-6
8.	Observation platform

[Registered No. M-1
[Price : Rs. 1.35

TAMIL NADU GOVERNMENT GAZETTE

PUBLISHED BY AUTHORITY

No. 6] CHENNAI, WEDNESDAY, FEBRUARY 17, 1999
Maasi 5, Vekuthaniya, Thiruvalluvar Aandu–2030

Part II–Section 2

Notifications or orders of interest to a section of the public issued by Secretariat Departments.

CONTENTS

NOTIFICATIONS BY GOVERNMENT.

South.—Thence the boundary runs from Udayamarthandapuram R.S. Nos. 32, 34, 37 which are wet lands.

West.—Then the boundary ends in 08 Pinnathur village, R.S. Nos. 337-6, 337-1, to 13, 388, 339-1 to 3, 4, 346, 347-1, 2 to 9, 348, 349, 350 351, 352, 354 covering irrigation canals, wetlands and poramboke.

Appointment of Commission of Inquiry to enquire the causes and circumstances of the major fire that occurred at Thirupathur Sandalwood Additional Depot in North Arcot-Ambedkar district on 16th March 1997.

[G.O. Ms. No. 14, Environment and Forests (FR. IV), 14th January 1999.]

AMENDMENT TO NOTIFICATION.

No. II(2)/EF/102/99.—In exercise of the powers conferred by sub-section (1) of the said section 5 of the Commission of Inquiry Act, 1952 (Central Act LIX of 1952), the Governor of Tamil Nadu hereby makes the following amendments to the Environment and Forests (FR.IV) Department Notification No.II(2)/EF/915(d)/ 97, dated the 3rd April 1997 published at page 178 of Part II—Section 2 of the *Tamil Nadu Government Gazette* Extraordinary, dated the 3rd April 1997:—

AMENDMENT.

In the said notification in paragraph 4, for the words "two months" the words "one year and eleven months" shall be substituted.

K.S. SRIPATHI,
Secretary to Government.

HEALTH AND FAMILY WELFARE DEPARTMENT.

Constitution of Committee to recommend the panel of three names to the Chancellor for filling up of the post of Vice-Chancellor to the Tamil Nadu Dr. M.G.R. Medical University.

AMENDMENT TO NOTIFICATION.

[Letter No. 53469/MCAL/98-6, Health and Family Welfare, 18th January 1999.]

No. II(2)/HF/103/99.—The following Amendment is issued to notification No.II(2)/HF/13/99, published in Part II—Section 2, at page 8 in the *Tamil Nadu Government Gazette*, dated 13th January 1999:—

AMENDMENT.

For the existing words "Chairman" occuring in paragraph 2 of the said notification the word "Convener" shall be substituted.

V. VISWANATHAN,
Secretary to Government.

HOME DEPARTMENT.

Remission of tax and penalty payable by Goods Carriage permit holders of the State of Andhra Pradesh, Karnataka, Kerala and Rajasthan in respect of certain goods carriages for certain period.

[G.O. Ms. No. 1737, Home (Transport III), 28th December 1998.]

No. **II(2)/HO/104/99**.—In exercise of the powers conferred by clause (1) of section 20-A of the Tamil Nadu Motor Vehicles Taxation Act, 1974 (Tamil Nadu Act 1 of 1974), the Governor of Tamil Nadu hereby remits a sum of Rs.1,93,311 (Rupees One lakh Ninety-Three thousand three hundred and eleven only) being the tax and the *penalty* payable under the said Act by Goods Carriage permit holders of the State of Andhra Pradesh, Karnataka, Kerala and Rajasthan, payable under the said Act in respect of the goods carriages as detailed in the Annexure.

ANNEXURE

DETAILS OF AMOUNT OF DIFFERENCE OF COMPOSITE TAX AND PENALTY FOR BELATED PAYMENT OF COMPOSITE TAX DUE OR THE GOODS CARRIAGES OF OTHER STATES.

Registration No. of vehicles. (1)	*Period* (2)		*Amount of Tax due.* (3) Rs.
	From	*To*	
ANDHRA PRADESH—			
AHK 2349	1st April 1991	30th September 1991	100
AEB 7155	Do.		900
AP. 28-J1	Do.		800
AIH 5628	Do.		800
AII 2744	Do.		800
AP. 28-T 1184	Do.		800
AP. 28-T 612	Do.		800
AAT 3969	1st April 1991	31st March 1992	900
AP. 28-T844	1st April 1991	30th September 1991	300
AP. 28-T 1082	Do.		300
AIH 6844	Do.		300
ATR 7281	Do.		900
AP. 28-T 1068	1st April 1991	31st March 1992	700
AHB 1194	1st April 1991	30th September 1991	300
AIH 4599	Do.		900
ABT 5549	Do.		700
AIH 4078	Do.		800
ATR 5684	Do.		1087
AP. 28-T 781	Do.		1087
AP. 28-T 1127	Do.		800
AP. 28-T 2255	Do.		800
AP. 28-T 2225	Do.		800
AP. 28-T 1185	Do.		800

NOTIFICATIONS BY GOVERNMENT.

COMMERCIAL TAXES DEPARTMENT.

Notifying certain Official as Appellate Authority for Registration Department.

[G.O. Ms. No. 280, Commercial Taxes, 18th September 1998.]

No. II(2)/CT/98/99.—Under sub-section (1) of section 4 of the Tamil Nadu Right to Information Act, 1997 (Tamil Nadu Act 24 of 1997), the Governor of Tamil Nadu hereby notifies the Inspector-General of Registration, 120, Santhome High Road, Chennai-600 028, as the authority to whom appeal may be preferred under the said section 4 of the said Act, so far as Registration Department is concerned.

K.A. MATHEW,
Secretary to Government.

Provision for consolidation of stamp duty on Debenture Certificates to be issued by Thiruvalargal Sakthi Finance Ltd., Coimbatore.

[G.O. (D) No.449, Commercial Taxes(J1), 9th December 1998.]

No. II(2)/CT/99/99.—In exercise of the powers conferred by clause (*b*) of sub-section (1) of section 9 of the Indian Stamp Act, 1899 (Central Act II of 1899), the Governor of Tamil Nadu hereby provides for the consolidation of duty of Rs.3,75,000 (Rupees Three lakhs and Seventy five thousand only) chargeable under the said Act and paid in respect of 50,000 Secured Non-Convertible Debentures of value of Rs.1,000 each aggregating to a total value of Rs.5 crores bearing distinctive numbers from 151001 to 200000 to be issued under Series II by Thiruvalargal Sakthi Finance Ltd., 475, Dr. Nanjappa Road, P.B. 3745, Coimbatore-641 018.

Provision for consolidation of stamp duty on share certificates to be issued by Thiruvalargal Macmillan India Limited, Chennai.

[G.O. (D) No.28, Commercial Taxes (J1), 29th January 1999.]

No. II(2)/CT/100/99.—In exercise of the powers conferred by clause (*b*) of sub-section (1) of section 9 of the Indian Stamp Act, 1899 (Central Act II of 1899), the Governor of Tamil Nadu hereby provides for the consolidation of duty of Rs. 40,000 (Rupees Forty thousand only) chargeable under the said Act and paid in respect of 40,000 share certificates of value of Rs.10 each bearing serial numbers from 14439 to 54438 to be issued by Thiruvalargal Macmillan India, Limited, 21, Patullos Road, Chennai-600 002.

R. BALAKRISHNAN,
Deputy Secretary to Government.

ENVIRONMENT AND FORESTS DEPARTMENT.

Declaration of Udayamarthandapuram Lake i Thiruthuraipoondi taluk, Thiruvarur district as Bird Sanctuary.

[G.O. Ms. No. 379, Environment and Forests (FR.V), 31st December 1998.]

No. II(2)/EF/101/99.—Whereas, the area specified in the Schedul below is not an area comprised within any reserve forest of th territorial matters;

And whereas, the Government of Tamil Nadu considered that th area specified in the schedule below is of adequate ecological fauna floral and geomorphological significance for the purpose of protectin propagating, developing wildlife and its environment;

And whereas, in the notification issued under sub-section (1) section 18 of the Wildlife (Protection) Act, 1972 (Central Act 53 1972), the Governor of Tamil Nadu declared his intention to constitu the area specified in the schedule to be a sanctuary called th Udayamarthandapuram Birds Sanctuary and the same has bee publised in the Environment and Forests (Fr.V) Departme Notification No.II(2)/EF/628/98, at page 146 of Part II—Section 2 the *Tamil Nadu Government Gazette*, dated the 1st April 1998;

And whereas, the Collector, Thiruvarur district has published proclamation under section 21 of the said Act, in and around th village and in the Government offices of the area comprised there requiring any person claiming any right mentioned in section 19 the said Act within two months from the date of proclamation a preferred within the time specified above;

Now, therefore, in exercise of the powers conferred by su section (1) of section 26-A of the Wildlife (Protection) Act, 19 (Central Act 53 of 1972), the Governor of Tamil Nadu here declares that the area specified in the schedule below shall be sanctuary called the 'Udayamarthandapuram Birds Sanctuary' w effect on and from the date of publication of this notification.

SCHEDULE.

1. Name of the district	..	Tiruvarur
2. Name of the taluk	..	Tiruthuraipoondi
3. Name of the village.	..	Udayamarthandapuram
4. R.S. No.	..	11/1
5. Total area	..	45.28.5 Hectares or 111.00 ac
6. Name of Sanctuary	..	Udayamarthandapuram Birds Sanctuary.

Boundary Description.

North.—The boundary starts from Udayamarthandapuram vill R.S. Nos. part of 1 and 2, 3, 4, 5, 6, 7, 8-1, 2A, 2B, 9-1A, 9-9-2 covering wet lands and poramboke.

East.—Thence the boundary runs from Udayamarthandapu R.S.Nos. 10-1, 10-2, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22-1A, 22-1B, 22-4A, 22-4B, 22-2, 3A, 23 covering wet la poramboke lands and roads.