Occasional Papers of IUCN Sri Lanka
No. 8, July 2005

A Biodiversity Status Profile of Lunama - Kalametiya Wetland Sanctuary

S. P. Ekanayake, C. N. B. Bambaradeniya,
W. P. N. Perera, M. S. J. Perera, R. K. Rodrigo,
V. A. M. P. K. Samarawickrama and T. N. Peiris

IUCN - The World Conservation Union, Sri Lanka Country Office

This publication has been prepared by IUCN - Sri Lanka
with financial assistance from the Royal Netherlands Government

IUCN
The World Conservation Union

This publication has been made possible in part by funding from the Royal Netherlands Government.

Published by : IUCN - Sri Lanka

IUCN
The World Conservation Union

Citation : S. P. Ekanayake, C. N. B. Bambaradeniya, W. P. N. Perera, M. S. J. Perera, R. K. Rodrigo, V. A. M. P. K. Samarawickrema and T. N.Peiris. 2005. A Biodiversity Status Profile of Lunama - Kalametiya Wetland Sanctuary. *Occ. Pap. 8. IUCN, Sri Lanka., iv+43pp*

ISBN : 955-8177-40-7

Cover photograph by : Naalin Perera

Produced by : IUCN Sri Lanka.

Printed by : Karunaratne & Sons Ltd. 67, UDA Industrial Estate, Katuwana Road, Homagama, Sri Lanka.

Available from : IUCN - Sri Lanka
No. 53, Horton Place, Colombo 7, Sri Lanka.

Contents

1. Introduction 1

1.1 Location, climate and physiography of the sanctuary 1

1.2 Administration of the sanctuary 2

1.3 Previous studies 2

1.4 Objectives of the present study 2

2. Study methods 3

2.1 Sampling frequency and sampling sites 3

2.2 Sampling techniques 3

2.3 Identification and nomenclature of fauna and flora 4

2.4 Preparation of digitized maps of vegetation types/habitats 4

3. Major habitat types and flora 5

4. Species composition of Fauna 9

5. Threats to biodiversity 11

5.1 Destruction and Degradation of habitats/ecosystems 11

5.2 Direct overexploitation of species 12

5.3 Spread of invasive alien species 12

5.4 Natural factors 13

6. Recommendations for the conservation of biodiversity in the Lunama-Kalametiya wetland 14

6.1 Action to conserve natural ecosystems, habitats and species 14

6.2 Action to prevent the degradation/destruction of habitats/ecosystems 14

Acknowledgements 16

Annexes 21

Literature Cited 42

1. Introduction

1.1 Location, climate and physiography of the sanctuary

The Lunama and Kalametiya lagoons are located on the south-eastern coast of Sri Lanka, in the Hambantota District, about 200 km from Colombo (Figure 1.1). The smaller Lunama lagoon covers 192 ha and the Kalametiya lagoon about 606 ha and they are interconnected. The lagoons are in the Dry Zone of Sri Lanka, which receives an annual rainfall of 1000 - 1250 mm, and experiences two distinct dry spells, in February and July-August. The mean air temperature is about 27^0C (CEA/Euroconsult,1995).

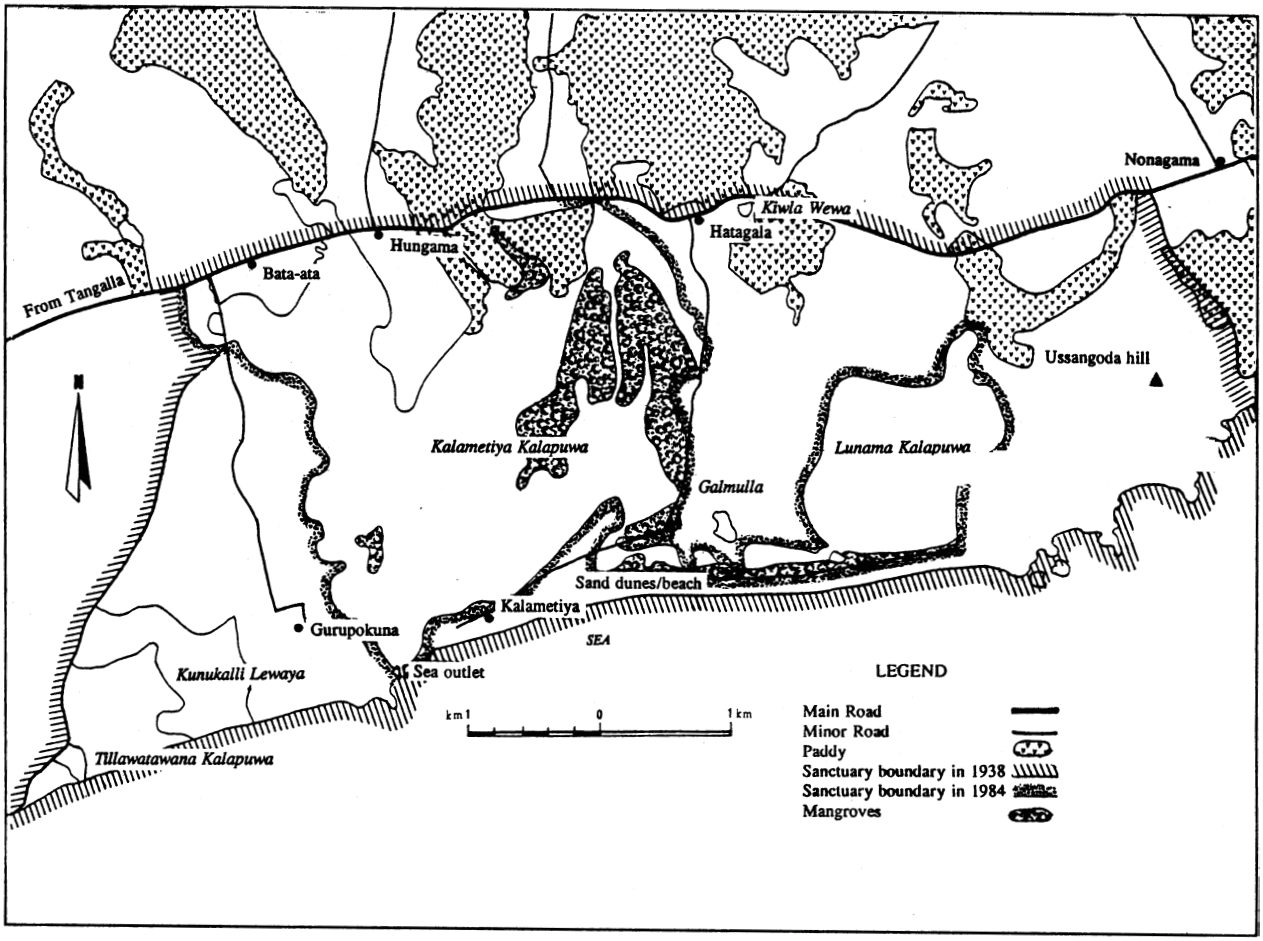


Figure 1.1
Map of the Lunama-Kalametiya area
Source: CEA/Euroconsult (1995)

The Kalametiya lagoon opens to the sea by a narrow man-made outlet and is connected to the Lunama lagoon through a shallow, 2 km man-made channel. These two shallow lagoons, with a mean depth of less than 1 m, are fed by the Kuchchigal Ara, and are surrounded by fringes of marsh and mangrove vegetation (CEA/Euroconsult, 1995).

1.2 Administration of the sanctuary

In recognition of the importance of Lunama and Kalametiya lagoons as wildlife habitats, an area of 700 ha was declared a Sanctuary under the Fauna and Flora Protection Ordinance in 1984, under the administration of the Department of Wildlife Conservation. Presently, this area comes under the Hambantota Integrated Coastal Zone Management Project (HICZMP), implemented by the Coast Conservation Department.

1.3 Previous studies

The inclusion of the Lunama-Kalametiya wetlands in the Directory of Asian Wetlands underscores their significance for conservation (Scott, 1989). A site report and a conservation management plan for the interconnected Kalametiya and Lunama lagoons were prepared, in 1995, by the Central Environmental Authority (CEA). The Forest Department and IUCN prepared a mangrove management plan for 10 selected mangrove sites located south of Colombo, including the mangrove around the Kalametiya lagoon (Anon, 2000). The avifauna of Kalametiya has been well documented by ornithologists who frequently visit this site. Also, with five species of globally threatened turtles nesting in the nearby beaches several turtle surveys have been conducted in this area (Amarasooriya, 2000).

The HICZMP has also reported their findings from several studies in the area. An important component of the above project was the identification and classification of environmentally sensitive areas in the Hambantota District (HICZMP, 2000a). The Kalametiya lagoon is among the 89 environmentally sensitive areas identified and listed by the project.

1.4 Objectives of the present study

The overall objective of this study is to compile a comprehensive set of baseline data on biodiversity in the Lunama-Kalametiya wetland system in order to facilitate management of this protected area.

2. Study methods

The main elements of this study to assess the biodiversity of the Lunama-Kalametiya area were:

- The review of existing published information on the study area to collate the available baseline information.
- An initial reconnaissance survey of the study area to identify habitats and vegetation types, select representative sampling sites, plan sampling schedules and test the pre-planned sampling methods to document animals and plants.
- A systematic compilation of inventories of fauna and flora using standard scientific techniques.
- An assessment of threats to biodiversity.

2.1 Sampling frequency and sampling sites

Systematic sampling was conducted at fortnightly intervals over the study period of 6 months, from October 1st 2002 to 31st March, 2003. Fauna was sampled both day and night. An initial reconnaissance survey identified the major habitats and vegetation types associated with the Lunama and Kalametiya lagoons, based on structure and composition of vegetation and edaphic factors. Three randomly selected sampling sites, in each lagoon, was surveyed during each fortnightly visit, to ensure fair coverage of all the selected habitats.

2.2 Sampling techniques

The inland faunal and floral surveys were carried out using standard sampling techniques specified in Sutherland (1996), with slight modifications to suit the existing field conditions (Table 1).

Table 1
Sampling methods by groups of fauna and flora

Group	Sampling method
Fish	Cast netting; Seine netting; Commercial catch; Bank counts.
Amphibians	Pitfall traps; 100 m x 5 m line/belt transects; Visual encounter surveys.
Reptiles	Pitfall traps; 100 m x 5 m line/belt transects; Visual encounter surveys.
Birds	Point transects, with 100-200 m radius (in water); 100 m x 50 m line transects (on land)
Mammals	100 m line transects; Trapping (Sherman traps); Visual encounter surveys, Indirect methods (tracks, faecal matter etc.)
Molluscs	Terrestrial: 100 m x 5 m belt transects; Aquatic: 1x1 plots
Butterflies	100 m x 5 m line transects
Mangrove and Terrestrial Vegetation	25 m x 25 m plots

2.3 Identification and nomenclature of fauna and flora

The inland flora of the study area were identified and classified using Dassanayake, M. D. & Fosberg, F. R. (eds.) (1980-1991), Dassanayake, M. D., Fosberg, F. R. & Clayton, W. D. (eds.) (1994 -1995), and Dassanayake, M. D.,& Clayton, W. D. (eds.) (1996-1999). Authentication was done at National Herbarium (Peradeniya). The fresh and brackish water fish were identified using Pethiyagoda (1990); De Bruin et al. (1994). In the herpetofauna, the amphibians were identified using Dutta & Manamendra-Aarachchi (1996), while the reptiles were identified using Deraniyagala (1953), and De Silva (1990). The birds and mammals were identified and classified using Harrison & Worfolk (1999) and Phillips (1980), respectively. In the inland invertebrates, the butterflies were identified using D'Abrera (1998) and Ackery (1999), while the terrestrial and brackish water mollusks were identified using Naggs & Raheem (2000) and Pinto (1986).

The work of Dubois and Ohler (1999), Groves and Meijaard (2005), Rasmussem and Anderton (2005), Senaratne (2001), and Wilson and Reeder (1993) were also used to document recent taxonomic and status changes of animals and plants.

2.4 Preparation of digitized maps of vegetation types/habitats

Recent aerial photographs and land-use maps, obtained from the Survey Department, were subjected to a ground-truthing exercise and geo-referencing with a GPS meter. GIS and remote sensing techniques were then used to prepare digitized maps of habitats/vegetation types associated with the Lunama and Kalametiya lagoons.

3. Major habitat types and flora

The Lunama-Kalametiya area harbours a variety of natural and man-made vegetation/habitat types, including both terrestrial and wetland systems (Table 1 and Figure 1).

Table 1
Major vegetation/habitat types found in the study area

Vegetation / Habitat Type	Kalametiya	Lunama
Natural Terrestrial		
Sand dune		X
Scrubland	X	X
Grassland	X	X
Natural wetland		
Mangrove	X	X
Reed bed	X	
Salt marsh		X
Lagoon	X	X
Coral reef		X
Sand stone reef	X	X
Sea shore vegetation	X	X
Seasonal pond	X	
Anthropogenic terrestrial		
Coconut Plantation	X	X
Home Garden/Chena	X	X
Anthropogenic wetland		
Paddy field	X	

X - Indicates presence

The shallow marine belt bordering Lunama-Kalametiya area harbours a coral reef as well as a sandstone reef. Small patches of sand dunes are located to the east of Lunama lagoon. Creeping vegetation such as *Ipomoea pes-caprae* and *Spinifex littoreus* occur on these dunes. Mangroves in Kalametiya are dominated by *Sonneratia caseolaris*, while those in Lunama are dominated by *Excoecaria agallocha*. Patches of scrubland are also located around the lagoons, dominated by thorny species such as *Flueggea leucopyrus* and *Dichrostachys cinerea*.The reedbeds adjoining the lagoons are dominated by *Typha angustifolia*. The grasslands consist of species such as *Cynodon dactylon* and *Panicum repens*. The frequently inundated areas of the lagoon consist of salt marsh communities, dominated by salt-tolerant species such as *Halosarcia indica.*

A total of 209 plant species were recorded from the above habitat types, including 12 climbers, 113 herbs, 39 shrubs and 45 tree species (Annex 1). These include three endemic species and ten invasive alien species. The dominant plant species occurring in natural terrestrial and wetland habitats of the Lunama-Kalametiya area are listed in Table 2.

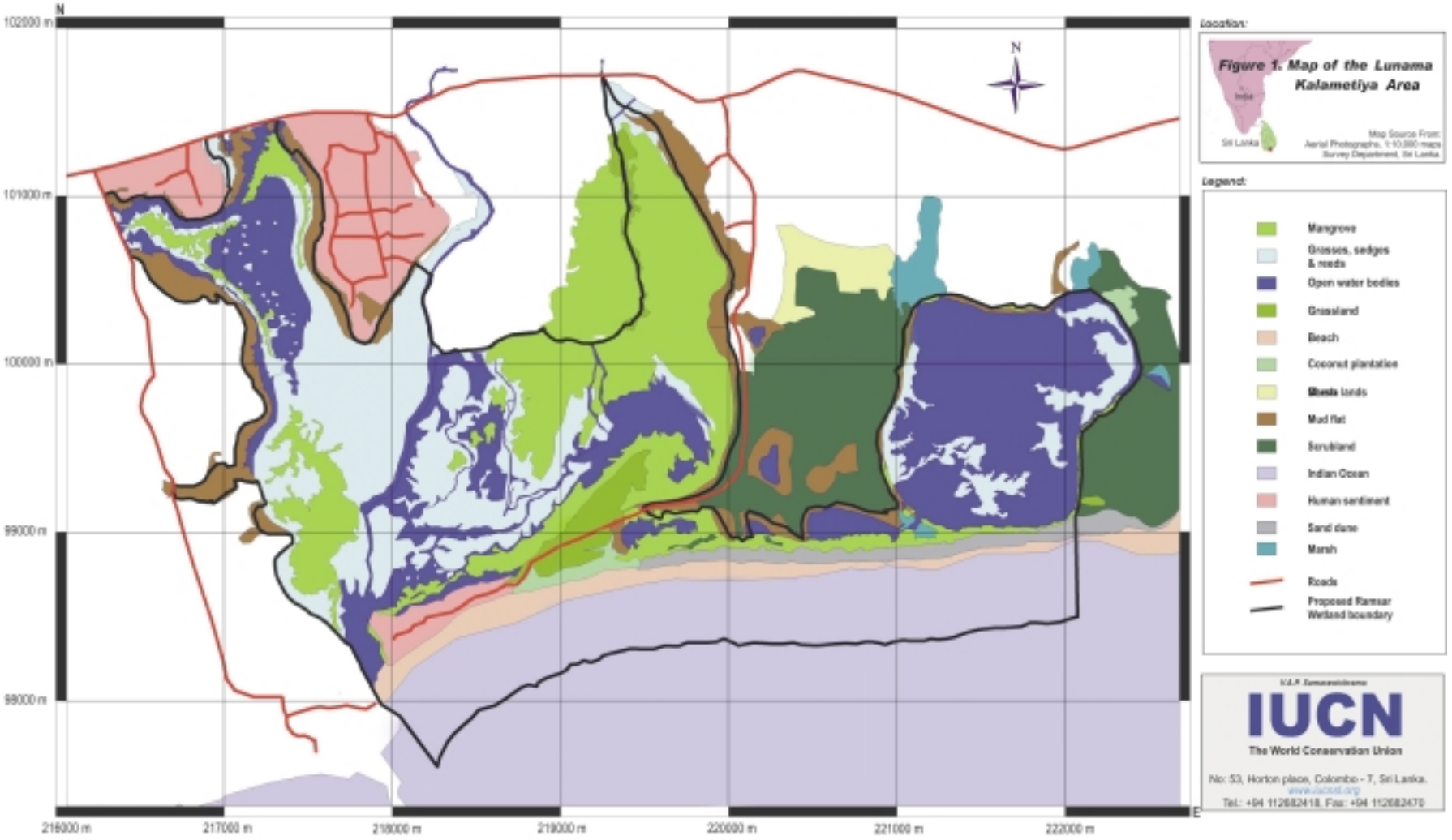


Figure 3.1
Major vegetation / habitat types found in Lunama-Kalametiya sanctuary

Table 2
Common plants in different habitats and vegetation types of Lunama - Kalametiya area.

Habitat/Vegetation type	Scientific Name	Family	Local name
Mangrove	*Sonneratia caseolaris*	Sonneratiaceae	Kirala
	Excoecaria agallocha	Euphorbiaceae	Thelakeeriya
	Avicennia marina	Avicenniaceae	Kadol
	Acanthus ilicifolius	Acanthaceae	Katu Ikiliya
	Acrostichum aureum	Pteridaceae	Karan Koku
	Ceriops tagal	Rhizoporaceae	
	Lumnitzera racemosa	Combretaceae	
Sand dune vegetation	*Spinifex littoreus*	Poaceae	Maharawana revula
	Hydrophylax maritima	Rubiaceae	Mudu geta kola
	Azima tetracantha	Salvadoraceae	
	Cyperus bulbosus	Cyperaceae	
Scrubland	*Dichrostachys cinerea*	Fabaceae	Andara
	Flueggea leucopyrus	Euphorbiaceae	Heen katupila
	Capparis sepiaria	Capparidaceae	Torikei
	Carissa spinarum	Apocynaceae	Heen karamba
	Azima tetracantha	Salvadoraceae	
	Randia dumetorium	Rubiaceae	Kukurumanna
	Cassia auriculata	Fabaceae	Ranawara
	Opuntia dillenii	Cactaceae	Katu Pathok
Gentle sea shore	*Spinifex littoreus*	Poaceae	Maharawana revula
Vegetation	*Ziziphus oenoplia*	Rhamnaceae	Eraminiya
	Launaea sarmentosa	Asteraceae	
	Opuntia dillenii	Cactaceae	Katu Pathok
	Capparis sepiaria	Capparidaceae	Torikei
	Cyperus bulbosus	Cyperaceae	
	Hydrophylax maritima	Rubiaceae	Mudu geta kola
	Ipomoea pes-caprae	Convolvulaceae	Mudu bimtamburu
	Evolvulus alsinoides	Convolvulaceae	Vishnukranthi
	Lantana camara	Verbenaceae	Hinguru
	Pandanus odoratisimum	Pandanaceae	Wetakeyiya, Mudukeyiya
Grasslands	*Cynodon dactylon*	Poaceae	Ruha, Belathana
	Cyperus rotundus	Cyperaceae	Kalanduru
	Eragrostis gangetica	Poaceae	Ela kuru thana
	Kyllinga nemoralis	Cyperaceae	Mottu thana
	Panicum repens	Poaceae	Etora

Habitat/Vegetation type	Scientific Name	Family	Local name
Saltmarsh community	*Halosarcia indica*	Chenopodiaceae	
	Cynodon dactylon	Poaceae	Ruha, Belathana
	Cyperus stoloniferus	Cyperaceae	
	Prosopis juliflora	Fabaceae	Katu andara
Reed beds	*Typha angustifolia*	Typhaceae	Hambu pan
	Ceratophyllum demersum	Ceratophyllaceae	
	Cyperus rotundus	Cyperaceae	Kalanduru
	Eleocharis geniculata	Cyperaceae	
	Cynodon dactylon	Poaceae	Ruha, Belathana

4. Species composition of Fauna

A total of 283 species of vertebrates were recorded from the Lunama-Kalametiya area, of which 14 species (5%) are endemic, while 17 species (6%) are nationally threatened. The vertebrates are comprised of 35 species of fish, 13 species of amphibians, 43 species of reptiles, 168 species of birds, and 24 species of mammals. The invertebrates documented include 75 species of butterflies and 18 mollusc species.

A total of 35 species of fish were recorded from the lagoons and canals in the Lunama-Kalametiya area (Annex 2), including three endemics and two threatened species. These include salt water dispersants (eg. Short-finned Eel - *Anguilla bicolor*), marine forms (eg. Bigeye Travally - *Caranx sexfasiatus*), brackish water forms (eg. Brown gudgeon - *Eleophis fusca*) and freshwater forms (eg. Murrel - *Channa striata*). The Deep body Silverbiddy (*Gerres abreviatus*), Dwarf panchax (*Aplocheilus parvus*), Blue Eyes (*Oryzias melastigma*), Bloch's Gizzard Shad (*Nematalosa nasus*) and the exotic Mozambique Tilapia (*Oreochromis mossambicus*) are abundant in the lagoons.

The area harbours 13 species of amphibians (Annex 3). They include toads (eg. Common Toad - *Bufo melanostictus*), narrow-mouthed frogs (eg. Ornate Narrow-mouthed Frog - *Microhyla ornata*), common frogs (eg. Skipper Frog - *Euphlyctis cyanophlyctis*) and tree frogs (eg. Chunam Tree-Frog - *Polypedates maculatus*).

A total of 43 species of reptiles were recorded from the area (Annex 4) including 4 endemic species and 7 species that are nationally threatened. Among the reptiles are three species of globally threatened marine turtles that visit the sea shores of the Lunama-Kalametiya area for nesting, while the Mugger (*Crocodylus palustris*) and the Indian Python (*Python molurus*) are also considered as globally threatened species.

The complex system of wetlands and terrestrial habitats in the Lunama-Kalametiya area has contributed to a rich bird diversity, including many species of migratory birds. A total of 168 species of birds were recorded from the area during the six month survey period (Annex 5). These include 121 residents, 46 winter migrants and one off-shore marine bird. Among the resident birds, five species are endemic, while 5 species are nationally threatened. Of the migratory species, 45 are regular migrants, while common-ringed plover is an occasional visitor or vagrant. The lagoons, inter-tidal mudflats and salt-marsh areas provide ideal resting and feeding habitats for numerous species of winter migrants, especially the wading birds. The vast numbers of migratory Stints, Sandpipers, Plovers, Terns, Gulls, and Ducks share the wetlands with resident wetland birds such as Herons, Egrets, Pelicans, Cormorants, Teals, Storks and Stilts.

The mammals recorded from the area consist of 24 species, including two endemic and three threatened species (Annex 6). These include small mammals (Rats, Mice and Shrews), bats, large herbivores (Spotted Deer, Mouse Deer), carnivores (Fishing cat, Rusty-spotted cat,

Mongoose, Otter), scavengers (Jackal, Wild boar) and arboreal species (Macaque, Grey Langur). Grey Langur (*Semnopithecus entellus*), Black-naped Hare (*Lepus nigricollis*), Palm Squirrel (*Funambulus palmarum*), and Water Buffalo (*Bubalus bubalis* - mostly feral) are the most commonly seen mammals in the area.

About 75 species of butterflies were recorded from the area, including one endemic and 12 nationally threatened species (Annex 7). Majority of the butterfly species are found in the scrubland habitat. The three species of the Family Pieridae, Pioneer (*Belenois aurota*), Yellow Orange Tip (*Ixias pyrene*) and the Small Salmon Arab (*Colotis amata*) are among the commonest butterflies.

The molluscs recorded include ten land snail species and eight aquatic species (Annex 8). The land snails include five endemics and two nationally threatened species.

5. Threats to biodiversity

The threats that affect the biodiversity of the Lunama-Kalametiya area can be divided into four categories: destruction and degradation of habitats/ecosystems, direct / over exploitation of species, spread of invasive alien species and natural factors. These major threat categories and their contributory factors are discussed in the following sections.

5.1 Destruction and Degradation of habitats/ecosystems

Deforestation

The Kalametiya sanctuary is affected by deforestation. Villagers have cut down/burnt more than 50 ha of forested areas for their settlements, chena cultivation and shell mining. This has displaced forest dwelling birds from their habitats.

Mangroves have been cut down for human settlements and fuel wood. A mangrove patch in Lunama area has been cleared for illegal shell mining. It is well documented that mangroves bordering lagoons and estuaries provide refuge for the larval stages of aquatic organisms such as fish and crustaceans. Random interviews with local fishermen indicate that there is a decreasing trend in fish and crustacean catches, over the past decade. The loss of mangrove refuge could be one reason for the decrease in fishery.

Shell mining

Large-scale illegal shell mining was observed around the Kalametiya lagoon area. Shell mining has also caused the degradation of the mangroves and scrubland of the Lunama lagoon area.

Ill-planned irrigation infrastructure

The ecology of the Kalametiya lagoon has been adversely affected by defective irrigation structures. Drainage of irrigation water into the lagoon has lowered the salinity of lagoon water. Silt brought in has filled up at least 40% of the Kalametiya lagoon within the last 15 years. Consequently the lagoon cover has decreased and the filled area has been invaded by a monoculture of *Sonneratia caseolaris*. The Lunama lagoon is also affected by siltation. Decrease of salinity has aggravated the spread of invasive *Typha angustifolia* and *Eichhornia crassipes* mainly in the Kalametiya lagoon.

Discharge of agrochemicals into wetlands

Large amounts of agrochemicals, both biocides and fertilizers, are used in rice fields in the upstream areas of Lunama-Kalametiya, and is likely to adversely affect the aquatic life associated with wetlands. The Kalametiya lagoon shows signs of eutrophication, possibly due

to accumulation of chemical fertilizer residues. This condition has promoted the proliferation of invasive plants such as Water Hyacinth (*Eichhornia crassipes*) in the Kalametiya lagoon.

Unregulated animal husbandry activities

The grasslands of the Kalametiya area are overgrazed by cattle and buffalo allowed to roam freely. Several grasslands have been eroded due to overgrazing. These animals have also facilitated the spread of invasive alien plants such as Mesquite (*Prosopis juliflora*), since they feed on the pods of the latter plant.

Unauthorized development activities

Illegal encroachments and reclamation of wetlands have resulted in the fragmentation of natural habitats. This is clearly visible in the Kalametiya Sanctuary area.

5.2 Direct loss and overexploitation of species

Hunting and poaching of animals

Collection of turtle eggs and poaching of turtles occur regularly in the survey area. Turtle eggs are collected in the Lunama beach area. Trap guns set for mammals, were observed mainly in the Kalametiya area. According to the villagers birds are also hunted in Lunama and Kalametiya lagoons.

Road Kills

A section of the Kalametiya wetland extends up to the Matara - Hambantota main road. Many animals are subjected to road accidents within a 200m stretch of main road adjoining the wetland. Road kills documented include nationally threatened mammals such as the otter *(Lutra lutra)*, and several species of amphibians and reptiles.

5.3 Spread of invasive alien species

A number of alien invasive plant and animal species were documented from the survey area. Among the invasive alien plants, *Prosopis juliflora* (Mesquite), *Lantana camara* (Lantana) and *Opuntia dillenii* (Prickly-pear cactus) have invaded the terrestrial ecosystems in the area, while *Eichhornia crassipes* (Water hyacinth) and *Salvinia molesta* (Salvinia) have invaded the aquatic ecosystem. The spread of *P. juliflora* is facilitated by feral/unmanaged domestic cattle and buffalo, and it is gradually displacing native scrubland plant species, leading to monoculture stands.

Among the alien invasive fauna, Tilapia (*Oreochromis mossambicus* and *O. niloticus*) have established breeding populations in the lagoons, and the Garden snail (*Achatina fulica*), and feral domestic cats, dogs and cattle have invaded terrestrial ecosystems, causing negative impacts on native animals. The latter species are causing problems to terrestrial animals especially in Kalametiya. Feral dogs destroy turtle nests in the area and feed on turtle eggs.

5.4 Natural factors

Impact of the Tsunami

The Lunama wetland and inland landscape were shielded from the recent tsunami by the sand dune habitat. However, the tsunami waves were funneled into the Kalametiya lagoon, through the man-made opening to the sea, causing the destruction of around 5% of the *Sonneratia caseolaris* dominated mangrove stand around the lagoon. The increase in salinity in the lagoon has had a positive impact in destroying a high proportion of the invasive alien Water Hyacinth (*Eichhornia crassipes*) and the Cattail Reed (*Typha angustifolia*). Approximately 5 ha of grassland and salt marsh vegetation has been destroyed, covered with sand and sludge transported inland by the tsunami waves.

6. Recommendations for the conservation of biodiversity in the Lunama-Kalametiya wetland

The present study has clearly revealed that the Lunama-Kalametiya wetland area harbours a rich biodiversity, including a wide variety of ecosystems, habitats and species. The area serves as a refuge for several endemic as well as threatened species of plants and animals. However, the study also revealed that this inter-connected coastal wetland ecosystem is threatened by various anthropogenic activities. Considering the overall findings, the following recommendations are made to ensure the future sustenance of the Lunama-Kalametiya wetland and adjacent areas.

6.1 Action to conserve natural ecosystems, habitats and species

- Expand the Kalametiya Sanctuary to cover the Ussangoda scrubland and grassland, Ussangoda-Lunama beach and near-shore marine habitat including the coral reef, and re-demarcate the boundary of the Kalametiya protected area. Identify a core zone and a buffer zone in the re-demarcated Kalametiya Sanctuary.

  Action: Department of Wildlife Conservation, Coast Conservation Department (CRMP Project), Survey Department and IUCN.

- Declare the Lunama-Kalametiya wetland as a Ramsar Site - a wetland of international importance.

  Action: Department of Wildlife Conservation and IUCN

- Provide enhanced resources and initiate regular patrolling of the Lunama-Kalametiya and Ussangoda area, to curb illegal poaching operations.

  Action: Department of Wildlife Conservation and the RUK (Rekawa, Ussangoda, Kalametiya) Biodiversity Task Force

- Establish Biodiversity Task Forces to monitor threats to biodiversity in the Lunama-Kalametiya area, and ensure law enforcement.

  Action: RUK (Rekawa-Ussangoda-Kalametiya) Project Management Office, IUCN and the RUK Biodiversity Task Forces

- Organize awareness and training workshops for the biodiversity task force, local schools (students and teachers) and local CBOs in the surrounding areas of the Sanctuary. Prepare awareness material on biodiversity in the Lunama-Kalametiya area.

  Action: RUK Project Management Office, Department of Wildlife Conservation and IUCN

6.2 Action to prevent the degradation/destruction of habitats/ecosystems

- Issue of permits for shell mining in the Lunama-Kalametiya area should be better coordinated between the Coast Conservation Department (CCD), District Secretariat (DS)

and the Geological Survey and Mines Bureau (GSMB). Illegal coral, shell and gem mining should be dealt with strict enforcement of the law.

Action: CCD, GSMB, DS and the Tangalle Police Station.

- Vehicles should not be permitted to enter the Ussangoda grassland/beach area, and arrangements should be made for parking below the Ussangoda hill.

  Action: Pradeshiya Sabha and District Secretariat.

- The sand bar between the Kalametiya lagoon and the sea should be breached annually in order to raise the salinity levels and thereby destroy the invasive alien Water Hyacinth.

  Action: Coast Conservation Department (CRMP Project), Kalametiya Fisheries Society, Fisheries Department.

- Initiate physical removal of Prickly Pear Cactus (*Opuntia dillenii*) and Mesquite (*Prosopis juliflora*) from Ussangoda, Lunama and Kalametiya areas through community participation.

  Action: RUK Project Management Office, Rekawa Development Foundation, Local Schools, Biodiversity Task Forces.

- Minimize the drainage of irrigation water into the Kalametiya Lagoon by appropriate engineering interventions in the Lower-Kachchigal-ara area.

  Action: CRMP Project and Irrigation Department

- Exercise caution and minimize damage to natural ecosystems and species when conducting archaeological excavations in Godawaya and Ussangoda areas. Rare or endemic species should be rescued and translocated to suitable areas, prior to excavations.

  Action: Department of Archaeology

- Cattle grazing in the Kalametiya, Lunama and Ussangoda area should be regulated and restricted to a buffer zone.

  Action: Department of Wildlife Conservation

- Initiate action to demolish illegal constructions in the beach areas of the Lunama-Kalametiya area, and regularly monitor the coastline to avoid future encroachments and constructions.

  Action: Coast Conservation Department

Acknowledgements

IUCN Sri Lanka wishes to acknowledge the support rendered by the Director General and field staff of the Department of Wildlife Conservation in conducting the field work in the Lunama-Kalametiya Sanctuary. The UNDP GEF medium grants programme provided financial assistance for the study.

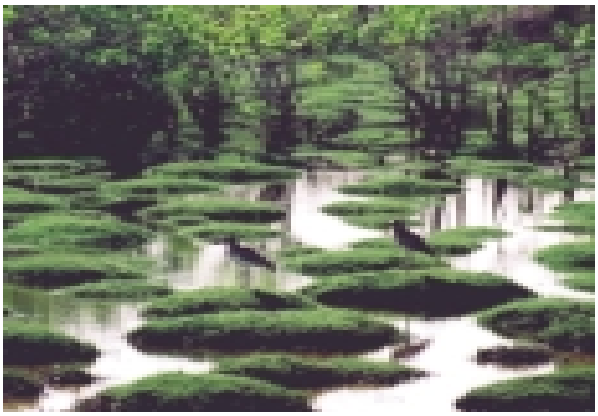
Habitats

Kalamatiya Lagoon Mouth and Sea
Picture by Naalin Perera

Sandy Beach
Picture by Sandun Perera

Sand Dune
Picture by Naalin Perera

Coastal Vegetation
Picture by Naalin Perera



Seasonally flooded Grasslands at the edge of mangroves in Kalametiya provides habitat for the nationally threatened bird the Great Thick-Knee *(Esacus recurvirostris)*
Picture by Sandun Perera

Seasonal Waterhole and Grassland
Picture by Naalin Perera

Fauna & Flora

Little Green Heron *(Butorides striatus)*
Picture by V. A. M. P. K. Samarawickrama

A flock of Garganeys *(Anas querquedula)* and Pintails *(Anas acuta)* taking off from feeding grounds in Kalametiya
Picture by Sandun Perera

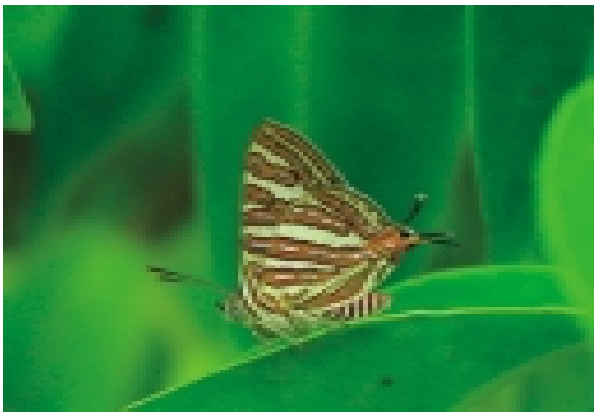
House musk shrew *(Suncus murinus)*
Picture by Naalin Perera

Black-naped hare *(Lepus nigricollis)*
Photograph: Dilup Chandranimal

Indian cobra *(Naja naja)*
Picture by Roshan Rodrigo

Leather-back Turtle *(Dermochelys coriacea)*
Picture by Sandun Perera

Fauna & Flora

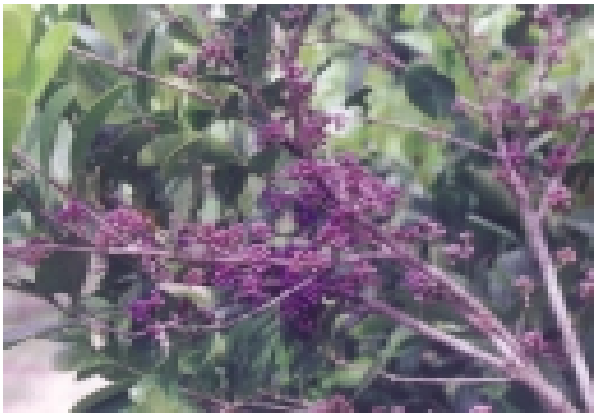


Common Silverline (*Surendra vulcanus)*
Picture by Naalin Perera

Common Tiger (*Danaus genutia)*
Picture by Sandun Perera

"Beriya" plant *(Lumnitzera racemosa)* - A common Mangrove plant of the Area.
Picture by Naalin Perera

"Katu Andara" *(Dicrostachys cinerea)*
Picture by Naalin Perera



"Kora kaha" *(Memecylon sylvaticum)*
Picture by Naalin Perera

"Gira Pala" *(Commelina* sp.*)*
Picture by Naalin Perera

Threats

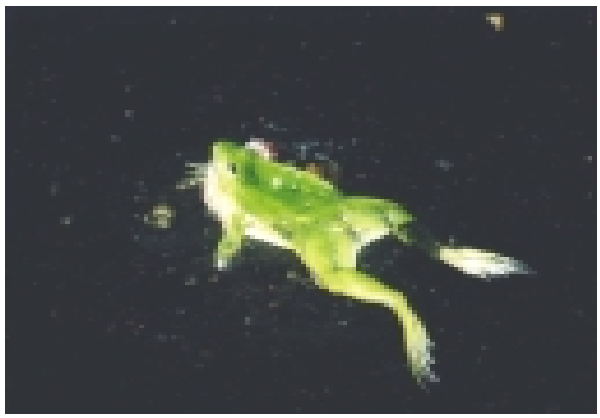
Chena cultivation in Lunama-Kalamatiya
Picture by Naalin Perera

Illegal shell mining in Lunama-Kalamatiya
Picture by Naalin Perera

Giant Guramy *(Osphronemus goramy)* Invasive alien fish species
Picture by Naalin Perera

Katu pathok *(Opuntia dillenii)* - Invasive alien plant species
Picture by Naalin Perera

Road kill of Jackal *(Canis aureus)*
Picture by Sandun Perera



Road Kill of *Euphyctis hexadactyla*
Picture by Sandun Perera

Annex 1

List of plants in the Lunama-Kalametiya wetland

Status : **E -** Endemic; **I -** Introduced; **IAS -** Invasive Alien Species; **NT -** Nationally Threatened
Habitat : **M -** Mangrove; **MX -** Mangrove mix; **MS -** Marsh; **HG -** Home Garden; **RD -** Roadside **G -** Grassland; **SC -** Scrubland; **CL -** Cultivated land; **SM -** Salt marsh; **PW -** Perennial stream **SW-** Seasonal water body
Abundance : **VC -** Very Common; **C -** Common; **UC -** Uncommon; **R -** Rare; **VR -** Very rare

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Acanthaceae	*Acanthus ilicifolius*	Ikiriya	M	C	Herb
Acanthaceae	*Barleria mysorensis*	Katu nelu	SC,HG	UC	Herb
Acanthaceae	*Barleria prionitis*	Katu karanda	SC,G	C	Herb
Acanthaceae	*Justicia* sp.		SC,HG	C	Herb
Amaranthaceae	*Achyranthes aspera*	Gas karal heba	RD,HG	C	Herb
Amaranthaceae	*Aerva lanata*	Polpala	RD,HG,	C	Herb
Amaranthaceae	*Alternanthera sessilis*	Mukunuwenna	MX,MS	C	Herb
Amaranthaceae	*Amaranthus viridis*	Kura thampala	RD,HG	C	Herb
Amaranthaceae	*Gomphrena celosioides* [I]		RD,HG	C	Herb
Amaryllidaceae	*Crinum latifolium*	Goda manel	SC,G	C	Herb
Anacardiaceae	*Anacardium occidentale* [I]	Kaju	HG	C	Tree
Apiaceae	*Centella asiatica*	Gotukola	HG,CL,SW	C	Herb
Apocynaceae	*Carissa spinarum*	Heen karamba	SC	C	Shrub
Apocynaceae	*Nerium oleander* [I]	Kaneru	HG	C	Herb
Apocynaceae	*Plumeria rubra*	Araliya	CL,HG	C	Shrub
Apocynaceae	*Thevetia peruviana* [I]	Kaduru	HG	C	Tree
Aponogetonaceae	*Aponogeton natans* [NT]		HG,SW	R	Herb
Araceae	*Alocasia macrorrhizos*	Habarala	RD	C	Herb
Araceae	*Colocasia esculenta*	Gahala	HG,CL	C	Herb
Arecaceae	*Cocos nucifera*	Pol, Thembili, Wewara	HG,CL	C	Tree
Arecaceae	*Phoenix pusilla*	Wal indi	SC,RD,MX	C	Shrub
Asclepiadaceae	*Calotropis gigantea*	Wara, Hela wara	SC,RD	C	Shrub
Asclepiadaceae	*Pergularia daemia*	Medahangu	SC,RD	C	Climber
Asclepiadaceae	*Tylophora indica*	Mudu bin nuga	SD	C	Climber
Asparagaceae	*Asparagus racemosus*	Hathawariya	SC,RD	C	Climber
Asteraceae	*Ageratum conyzoides*	Hulan thala	RD, HG	C	Herb
Asteraceae	*Emilia* sp.		RD,HG,	C	Herb
Asteraceae	*Eupatorium odoratum* [IAS]		SC,RD,HG	C	Herb
Asteraceae	*Launaea sarmentosa*		SD,BC	C	Herb
Asteraceae	*Mikania cordata* [IAS]	Gam palu, Wathu palu	RD,HG,	C	Climber
Asteraceae	*Sphaeranthus indicus*	Muda mahana	HG,RD,G	C	Herb
Asteraceae	*Tridax procumbens* [I]		RD,HG,	C	Herb

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Asteraceae	*Vernonia cinerea*	Monarakudumbiya	RD,HG,	C	Herb
Asteraceae	*Vernonia zeylanica* [E]	Heen botiya	SC,RD	C	Herb
Asteraceae	*Xanthium indicum* [IAS]	Wal rambutan Urukossa	RD,HG,	C	Herb
Avicenniaceae	*Avicennia marina*		M	UC	Tree
Boraginaceae	*Carmona retusa*	Heen tambala	SC,HG	C	Shrub
Boraginaceae	*Cordia* sp.	Lolu	SC,	C	Tree
Boraginaceae	*Heliotropium indicum*	Eth-honda, Dimi biya	SC,RD,HG	C	Herb
Cactaceae	*Opuntia dillenii* [IAS]	Katu pathok	SC,RD,HG	C	Herb
Capparaceae	*Capparis sepiaria*		SC	C	Shrub
Capparaceae	*Crateva adansonii*	Lunu warana	SC,RD,HG	C	Tree
Caricaceae	*Carica papaya*	Gas labu, Papol	HG,CL	C	Shrub
Celastraceae	*Cassine glauca* [E]	Neralu	SD,RD,HG,MX	C	Tree
Celastraceae	*Maytenus emarginata*		SD,RD	C	Shrub
Ceratophyllaceae	*Ceratophyllum demersum*		MX,MS	C	Herb
Chenopodiaceae	*Halosarcia indica*		SM	VC	Herb
Colchicaceae	*Gloriosa superba*	Niyangala	SC,RD	C	Climber
Combretaceae	*Lumnitzera racemosa*	Beriya	MC,MX	C	Shrub
Combretaceae	*Terminalia bellirica*	Bulu	HG	UC	Tree
Commelinaceae	*Commelina clavata*		RD,SW	C	Herb
Commelinaceae	*Commelina* sp.		RS,HG,RD, SC,GL	C	Herb
Commelinaceae	*Cyanotis* sp.		SC,RD	UC	Herb
Convolvulaceae	*Argyreia* sp.		HG,RD,	C	Climber
Convolvulaceae	*Evolvulus alsinoides*	Wishnukraanthi	G,CL	VC	Herb
Convolvulaceae	*Ipomoea aquatica*	Kankung	RS,MX,	C	Herb
Convolvulaceae	*Ipomoea pes-caprae*	Mudu bin tamburu	SD,BC	C	Herb
Convolvulaceae	*Ipomoea pes-tigridis*	Divi adiya,Divi pahuru	HG,RD,	C	Climber
Crassulaceae	*Kalanchoe pinnata* [I]	Akkapana, Rata gowa	SC,HG,RD	C	Herb
Cucurbitaceae	*Trichosanthes cucumerina*	Dum mella, Kunu mella	SC,HG,RD	C	Climber
Cyperaceae	*Cyperus stoloniferus*		SM,SW	C	Herb
Cyperaceae	*Cyperus arenarius*	Mudu kalanduru	SD	C	Herb
Cyperaceae	*Cyperus bulbosus*		SD	C	Herb
Cyperaceae	*Cyperus rotundus*	Kalanduru	RS,PW,SW, GL,MS	C	Herb
Cyperaceae	*Cyperus* sp.		MS	C	Herb
Cyperaceae	*Elaeocharis geniculata*		RS,PW,SW,MS	C	Herb
Cyperaceae	*Kyllinga nemoralis*	Mottu thana	G	C	Herb
Dracaenaceae	*Sansevieria zeylanica*	Niyanda	SC,G,	C	Herb
Euphorbiaceae	*Croton aromaticus*	Wel kappitiya	SC,HG	C	Shrub
Euphorbiaceae	*Croton bonplandianus* [I]		GL,HG,SC,RD	C	Herb
Euphorbiaceae	*Croton hirtus* [I]	Wal tippili, Gas veda	GL,HG,SC,RD	C	Herb
Euphorbiaceae	*Euphorbia antiquorum*	Daluk	SC,RD,HG	C	Herb

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Euphorbiaceae	*Euphorbia heterophylla* [I]		RD,HG,	C	Herb
Euphorbiaceae	*Euphorbia hirta*	Budadakiriya	G	C	Herb
Euphorbiaceae	*Euphorbia thymifolia*	Bin dada kiriya	G,SC,HG	C	Herb
Euphorbiaceae	*Euphorbia tirucalli* [I]	Nawa handi	SC,HG,RD	C	Herb
Euphorbiaceae	*Excoecaria agallocha*	Tela kiriya, Tala kiriya	MC,MX	C	Shrub
Euphorbiaceae	*Flueggea leucopyrus*	Heen katu pila	SC,RD	C	Shrub
Euphorbiaceae	*Jatropha curcas* [I]	Weta endaru, Rata endaru	RD,HG,	C	Shrub
Euphorbiaceae	*Jatropha gossypiifolia* [I]		RD,HG,	C	Herb
Euphorbiaceae	*Phyllanthus amarus*	Pita-wakka	RD,HG,	C	Herb
Euphorbiaceae	*Phyllanthus* sp.		SC,GL	C	Shrub
Euphorbiaceae	*Ricinus communis* [I]	Endaru	RD,HG,	C	Shrub
Fabaceae	*Acacia melanoxylon* [I]		MX,RD,HG	UC	Tree
Fabaceae	*Acacia planifrons*		SC	C	Tree
Fabaceae	*Aeschynomene indica*	Diya siyambala	MS,MX	C	Shrub
Fabaceae	*Bauhinia racemosa*	Maila	SC,HG	C	Tree
Fabaceae	*Caesalpinia bonduc*	Kalu vavulatiya, Kumburu wel	RD,SC,HG,	C	Climber
Fabaceae	*Cassia auriculata*	Ranawara	SC,HG,RD	VC	Tree
Fabaceae	*Cassia fistula* [I]	Ehela	SC,HG	C	Tree
Fabaceae	*Cassia mimosoides*	Bin siyambala	SC,GL,HG	C	Herb
Fabaceae	*Cassia occidentalis*	Peni tora	SC,GL	C	Shrub
Fabaceae	*Cassia* sp.		SC	C	Herb
Fabaceae	*Cassia tora*	Peti tora	SC,G	C	Herb
Fabaceae	*Crotalaria* sp.		SC,SD,G, HG,RD	C	Herb
Fabaceae	*Derris scandens*	Kalawel, Ala wel	M,MX	C	Climber
Fabaceae	*Desmodium* sp.		G,HG	C	Herb
Fabaceae	*Desmodium triflorum*	Heen undupiyaliya	G,HG,RD,	C	Herb
Fabaceae	*Dichrostachys cinerea*	Andara	SC,RD,HG,	C	Shrub
Fabaceae	*Gliricidia sepium*	Ladappa	RD,HG	C	Tree
Fabaceae	*Leucaena leucocephala* [IAS]	Ipil ipil	HG	C	Tree
Fabaceae	*Mimosa pudica* [I]	Nidikumba	HG,RD	C	Herb
Fabaceae	*Neptunia oleracea*	Diya nidikumba	MX,MS	C	Herb
Fabaceae	*Parkinsonia aculeata* [IAS]		HG,RD	C	Tree
Fabaceae	*Pithecellobium dulce* [I]		RD	C	Tree
Fabaceae	*Prosopis juliflora* [IAS]	Katu andara	RD,HG,	C	Tree
Fabaceae	*Tamarindus indica* [I]	Siyambala	HG,RD	C	Tree
Fabaceae	*Tephrosia purpurea*	Pila, Gam pila	HG,RD	C	Herb
Hydrocharitaceae	*Ottelia alismoides*		MS,MX,SW	C	Herb
Lamiaceae	*Hyptis capitata* [I]		RD,HG,	C	Herb
Lamiaceae	*Leucas zeylanica*	Geta thumba	RD,HG,G	C	Herb

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Loranthaceae	*Dendrophthoe falcata*	Pilila	RD,SC,HG,	C	Shrub
Lythraceae	*Lawsonia inermis*	Marathondi	HG	C	Shrub
Malvaceae	*Abutilon indicum*	Anoda	RD,HG,SC	C	Herb
Malvaceae	*Hibiscus micranthus*	Bebila	SC,HG,RD	C	Herb
Malvaceae	*Hibiscus tiliaceus*	Beli patta	MX,RD	C	Shrub
Malvaceae	*Hibiscus vitifolius*	Maha epala	RD,HG,SC	C	Shrub
Malvaceae	*Pavonia odorata*		RD,HG,SC	C	Herb
Malvaceae	*Sida acuta*	Gas bevila	RD,HG,SC	C	Herb
Malvaceae	*Sida cordifolia*	Heen anoda, Wel bevila	RD,HG,SC	C	Herb
Malvaceae	*Thespesia populnea*	Suriya, Gansuriya	RD,HG	VC	Tree
Malvaceae	*Urena lobata*	Patta epala	RD,HG,SC	C	Herb
Marsiliaceae	*Marsilia quadrifolia*		MX,MS,SW	C	Herb
Martyniaceae	*Martynia annua* [I]	Naga darana	RD,HG	C	Herb
Melastomataceae	*Memecylon sylvaticum* [E]	Kora kaha	SC,RD,HG	C	Shrub
Melastomataceae	*Memecylon urceolatum*		SC,RD,HG	C	Shrub
Meliaceae	*Azadirachta indica*	Kohomba	RD,HG.SC	C	Tree
Menyanthaceae	*Nymphoides hydrophylla*	Heen ambala	MS,SW,MX	C	Herb
Molluginaceae	*Mollugo pentaphylla*		SD	C	Herb
Moraceae	*Ficus benghalensis*	Maha nuga	RD	C	Tree
Moraceae	*Ficus racemosa*	Attikka	RD	UC	Tree
Moraceae	*Ficus tinctoria*	Wal ehetu, Gas netul	RD	UC	Tree
Moringaceae	*Moringa oleifera* [I]	Murunga	HG,RD	C	Tree
Musaceae	*Musa x paradisiaca* [I]	Kehel	HG	C	Herb
Myrsinaceae	*Aegiceras corniculata*	Heen kadol	MC,MX	C	Shrub
Myrsinaceae	*Ardisia willisii*	Lunu dan, Badulu dan	MX	C	Shrub
Nelumbonaceae	*Nelumbo nucifera*	Nelum	PW,MS	C	Herb
Nymphaeaceae	*Nymphaea pubescens*	Olu	PW,MS	C	Herb
Onagraceae	*Ludwigia* sp.[I]		MS,MX	C	Herb
Pandanaceae	*Pandanus odoratissimus*	Wetakeyiya, Mudukeyiya	BC	C	Shrub
Periplocaceae	*Hemidesmus indicus*	Heen iramusu	HG,RD.SC,G	C	Herb
Poaceae	*Axonopus compressus*	Potu tana	HG	C	Herb
Poaceae	*Axonopus fissifolius*	Heen potu tana	HG	C	Herb
Poaceae	*Cynodon dactylon*	Ruha	G,SD	C	Herb
Poaceae	*Dactyloctenium aegeyptium*	Putu tana	G,HG	C	Herb
Poaceae	*Digitaria ciliaris*	Guru tana	G,HG	C	Herb
Poaceae	*Digitaria longiflora*		G,HG	C	Herb
Poaceae	*Eragrostis gangetica*	Ela kuruthana	G	C	Herb
Poaceae	*Isachne globosa*	Bata della	G	C	Herb
Poaceae	*Isachne kunthiana*		G	C	Herb
Poaceae	*Ischaemum ciliare*	Rata tana	G	C	Herb
Poaceae	*Ischaemum rugosum*	Kudu kedu	G	C	Herb

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Poaceae	*Panicum maximum* [IAS]	Rata-tana	SW,G	C	Herb
Poaceae	*Panicum repens*	Etora	G, MS	C	Herb
Poaceae	*Paspalum scrobiculatum*	Amu	G	C	Herb
Poaceae	*Paspalum vaginatum*		G	C	Herb
Poaceae	*Spinifex littoreus*	Maha rawana ravla	SD,BC	C	Herb
Polygonaceae	*Persicaria glabra*		RS	C	Herb
Pontederiaceae	*Eichhornia crassipes* [IAS]	Japan jabara	PW,MS	C	Herb
Pontederiaceae	*Monochoria vaginalis*	Diya habarala	MS,MX,SW	C	Herb
Potamogetonaceae	*Potamogeton* sp.		PW	C	Herb
Potamogetonaceae	*Ruppia maritima*		PW	C	Herb
Pteridaceae	*Acrostichum aureum*	Karen koku	MC,MX	VC	Herb
Punicaceae	*Punica granatum* [I]	Delum	HG	C	Shrub
Rhamnaceae	*Scutia myrtina*		SC	C	Shrub
Rhamnaceae	*Ziziphus mauritiana*	Masan,Dabara	SC,RD,HG	VC	Shrub
Rhamnaceae	*Ziziphus oenoplia*	Heen-eraminiya	SC,RD,HG	C	Shrub
Rhizophoraceae	*Bruguiera gymnorhiza*	Mal kadol	MC,MX	C	Tree
Rhizophoraceae	*Ceriops tagal*		M	C	Tree
Rhizophoraceae	*Rhizophora mucronata*	Kadol	MC,MX	C	Tree
Rubiaceae	*Canthium coromandelicum*	Kara	SC,RD	C	Tree
Rubiaceae	*Hydrophylax maritima*		SD,BC	VC	Herb
Rubiaceae	*Ixora coccinea*	Ratambala	SC,MX,HG,RD	C	Shrub
Rubiaceae	*Ixora pavetta*	Maha ratambala	HG.SC,RD	C	Tree
Rubiaceae	*Morinda coreia*	Ahu	SC,HG	C	Tree
Rubiaceae	*Randia dumetorium*	Kukurumaanna	SC	UC	Shrub
Rubiaceae	*Tarenna asiatica*	Tarana	SC,RD	C	Tree
Rutaceae	*Atalantia ceylanica*	Yakinaran	SC	C	Shrub
Rutaceae	*Glycosmis mauritiana*		SC	C	Shrub
Rutaceae	*Limonia acidissima*	Divul, Diwul	SC,HG,RD	C	Tree
Salvadoraceae	*Azima tetracantha*		SC,HG,RD	C	Tree
Salvadoraceae	*Salvadora persica*	Maliththan	SC,HG,RD	VC	Tree
Salviniaceae	*Salvinia molesta* [IAS]	Salvinia	MS	UC	Herb
Santalaceae	*Santalum album* [I]	Sudu handun	HG,RD	C	Tree
Sapindaceae	*Cardiospermum halicacabum*	Penela wel	HG	C	Climber
Sapindaceae	*Schleichera oleosa*	Koon	HG,RD	C	Tree
Sapotaceae	*Manilkara hexandra*	Palu	SC,HG,RD	C	Tree
Scrophulariaceae	*Bacopa monnieri*	Lunu wila	MX,MS,SW	C	Herb
Solanaceae	*Capsicum annuum*	Miris	CL	C	Herb
Solanaceae	*Solanum melongena*	Ela batu	HG,RD,SC	C	Herb
Sonneratiaceae	*Sonneratia caseolaris*	Kirala	MC,MX	C	Tree
Sterculiaceae	*Waltheria indica*		HG.RD,	C	Herb
Tiliaceae	*Berrya cordifolia*	Hal milla	HG	C	Tree

Family	Species	Common Name	Habitat	Abund-ance	Life-form
Tiliaceae	*Grewia damine*	Daminiya	HG,RD	C	Tree
Tiliaceae	*Grewia orientalis*	Wel keliya, Wel mediya	SC,HG,RD	C	Shrub
Typhaceae	*Typha angustifolia*	Hambu pan	MS,MX,PW	VC	Herb
Verbenaceae	*Clerodendrum inerme*	Wal gurenda, Bu renda	MX	C	Shrub
Verbenaceae	*Clerodendrum infortunatum*	Gas pinna, Pinna kole	SC	C	Shrub
Verbenaceae	*Lantana camara* [IAS]		SC,RD,HG	C	Shrub
Verbenaceae	*Phyla nodiflora*	Hiramana datta	SD	C	Herb
Verbenaceae	*Premna tomentosa*	Seru, Boo seru	SC,RD	C	Tree
Verbenaceae	*Stachytarpheta jamaicensis* [I]	Balu nakuta	RD,HG,SC	C	Herb
Verbenaceae	*Tectona grandis* [I]	Thekka, Tekka	HG,CL	C	Tree
Verbenaceae	*Vitex altissima*	Milla	HG,RD,SC	C	Tree
Verbenaceae	*Vitex negundo*	Nika	SD,RD,HG	C	Tree
Viscaceae	*Viscum orientale*	Pilila	SC,RD,HG	C	Herb
Vitaceae	*Cayratia trifolia*	Walrat diya labu	MC,MX	C	Climber
Vitaceae	*Cissus quadrangularis*	Heeressa, Seerassa	SC,RD	C	Herb
Zygophyllaceae	*Tribulus terrestris*	Gokatu	GL,SC,HG	C	Herb

Total species = 209 (Including 3 endemics, 27 Introduced species, 1 Nationally threatened species and 11 Invasive alien species)

Life forms = Climbers 12, Herbs 113, Shrubs 39 and Trees 45.

Annex 2

List of fish species recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **L -** Lagoon, **T -** Tank, **I -** Irrigation Canal, **R -** River, **M -** Marsh
Habit : **SD -** Salt water dispersant, **M -** Marine, **F -** Freshwater, **B -** Brackish water
Relative Abundance : **VC** - Very Common; **C -** Common; **UC -** Uncommon; **R -** Rare; **VR -** Very Rare
Status : **E -** Endemic, **T -** Nationally Threatened, **I -** Introduced

Family	Species	Common name	Habitat	Abundance
Anguillidae	*Anguillar bicolor*	Level finned Eel	R,L	R
Clupeidae	*Nematalosa nasus*	Bloch's Gizzard Shad	L	VC
Engraulididae	*Trysa puruwa*	Obliquejaw thryssa	L	C
Cyprinidae	*Puntius bimaculatus*	Red-side Barb	I	UC
	Puntius vittatus	Silver Barb	I	UC
	Puntius sarana	Olive Barb	R	C
	Puntius singhala[E]	Filamented Barb	R,T	C
	Puntius chola	Swamp Barb	R,T,M	UC
	Puntius amphibius	Scarlet-banded Barb	R,T,M	UC
	Esomus thermoicos [E,T]	Flying Barb	T	UC
	Rasbora caverii	Common Rasbora	I	C
Cobitidae	*Lepidocephalichthys thermalis*	Common Spiny Loach	I	UC
Ariidae	*Arius jella*	Sea Catfish	R,L	UC
Bagridae	*Mystus gulio*	Long-whiskered Catfish	R,L	C
	Mystus keletius	Yellow Catfish	R,L	UC
Clariidae	*Clarias brachysoma* [E,T]	Walking Catfish	M,R	UC
Heteropneustidae	*Heteropneustes fossilis*	Stinging Catfish	M,R	UC
Oryziidae	*Oryzias melastigma*	Blue eyes	R,L,T,M	VC
Aplocheilidae	*Aplocheilus parvus*	Dwarf Panchax	R,L,T,M	VC
Syngnathidae	*Microphis* sp	Pipe Fish	R	R
Ambassidae	*Ambassis commersoni*	Common Glassfish	R,T	C
Terapontidae	*Terapon jarbua*	Jarbua Terapon	R,L	C
Charangidae	*Caranx sexfasciatus*	Bigeye Travally	R,L	C
	Caranx sp.	Travally	L	UC
Gerreidae	*Gerres abreviatus*	Deep-body Silverbiddy	R,L	VC
Chiclidae	*Oriochromis mossambicus*[I]	Tilapia	R,L,T	VC
	Oriochromis niloticus[I]	Nile Tilapia	R,L	C
	Etroplus suratensis	Pearl Spot	R,L,T	C
Mugilidae	*Liza macrolepis*	Larger Scale Mullet	R,L	C
Gobiidae	*Glossogobius giuris*	Bar-eyed Goby	R,L	UC
Eleotridae	*Eleophis fusca*	Brown gudgeon	R	R
Anabantidae	*Anabas testudineus*	Climbing Perch	R,M	UC
Belontidae	*Osphronemus goramy*[I]	Giant guramy	R	R
Channidae	*Channa striata*	Murrel	R,M,L	C
	Channa gachua	Brown Snakehead	M,L,I	UC

Annex 3

List of amphibians recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc -** Scrubland; **Gr -** Grassland; **Po -** Pond; **Ma -** Marshland; **Mn -** Mangrove; **Sm -** Salt Marsh; **Sd -** Coastal Sand Dune; **S -** Sea; **Ho -** Home Garden; **Ch -** Chena; **Pa -** Paddy Field; **Co -** Coconut Plantation

Relative Abundance : **VC -** Very Common; **C -** Common; **UC -** Uncommon; **R -** Rare; **VR -** Very Rare

Status : **E -** Endemic, **T -** Nationally Threatened

Family	Scientific Name	Commom Name	Habitat	Relative Abundance
Bufonidae	*Bufo scaber*	Ferguson's Dwarf Toad	Sm, Ho, Ma, Co, Ch & Mn	VC
	Bufo melanostictus	Common Toad	Co & Ho	C
Microhylidae	*Uperodon systoma*	Baloon Frog	Sm	UC
	Mycrohyla ornata	Ornate Narrow- mouthed Frog	Ma, Co & Pa	C
	Microhyla rubrum	Red Narrow-mouthed Frog	Co	UC
	Kaloula taprobanica	Common Bull Frog	Ho & Co	UC
Ranidae	*Sphaerotheca breviceps*	Banded Sand Frog	Co, Ho & Sc	C
	Sphaerotheca rolandae	Marbled Sand Frog	Gr	UC
	Limnonectes limnocharis	Common Paddy Field Frog	Ma, Ho, Sc, Pa & Mn	VC
	Hoplobatrachus crassus	Indian Bull Frog	Sc, Ho, Gr & Pa	C
	Euphlyctis cyanophlyctis	Skipper Frog	Ho, Pa, Ma, Sc, Mn, Gr & Ch	VC
	Euphlyctis hexadactyla	Six-toed Green Frog	P, Sc & Ho	C
	Polypedates maculatus	Chunam Tree-Frog	Gr	C

3 Families, 13 Species

Annex 4

List of reptiles recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc** - Scrubland; **Gr** - Grassland; **Po** - Pond; **Ma** - Marshland; **Mn** - Mangrove; **Sm** - Salt Marsh; **Sd** - Coastal Sand Dune; **S** - Sea; **Ho** - Home Garden; **Ch** - Chena; **Pa** - Paddy Field; **Co** - Coconut Plantation

Relative Abundance : **VC** - Very Common; **C** - Common; **UC** - Uncommon; **R** - Rare; **VR** - Very Rare Status: **E** Endemic, **T** Nationally Threatened

Family	Scientific Name	Commom Name	Habitat	Relative Abundance
Crocodylidae	*Crocodylus palustris*[T]	Mugger	Ma	UC
Bataguridae	*Melanochelys trijuga*[T]	Parker's Black Turtle	Pa & Mn	UC
Cheloniidae	*Chelonia mydas*[T]	Green Turtle	Sd	C
	Lepidochelys olivacea[T]	Olive Redley Sea Turtle	S	C
Dermochelyidae	*Dermochelys coriacea*[T]	Leatherback turtle	S	UC
Trionychidae	*Lissemys punctata*[T]	Flapshell Turtle	Pa, Mn & Ma	C
Agamidae	*Calotes calotes*	Green Garden Lizard	Sc & Mn	R
	Calotes versicolor	Common Garden Lizard	Ho, Co, Sd, Mn, Sc & Ch	VC
Gekkonidae	*Hemidactylus frenatus*	Common House Gecko	Ho, Co, Sc & Ch	VC
	Hemidactylus brookii	Spotted House Gecko	Ho	VC
	Hemidactylus triedrus	Termitehill Gecko	Gr & Sc	C
	Hemidactylus leschenaulti	Bark Gecko	Mn	UC
	Gehyra mutilata	Four Claw Gecko	Ho	UC
Scincidae	*Mabuya carinata*	Common Skink	Co & Ho	C
	Mabuya macularia	Bronzgreen Little Skink	Sc	UC
	Mabuya madaraszi[E, T]	Spotted Skink	Ho	VR
	Lankascincus fallax[E]	Commom Lanka Skink	Ho	UC
	Lygosoma punctata	Dotted Garden Skink	Ch	UC
Varanidae	*Varanus salvator*	Water Monitor	Sd, Ma, Mn, Sc, Ho, Po & Pa	VC
	Varanus bengalensis	Land Monitor	Pa, Sc, Gr, Mn, Ho & Ch	VC
Typhlopidae	*Ramphotyphlops braminus*	Commom Blind Snake	Ho	R
Boidae	*Python molurus*[T]	Indian Rock Python	Ho & Sc	VR
Colubridae	*Ahaetulla nasuta*	Green Vine Snake	Ho	UC
	Amphiesma stolata	Buff-Striped Keelback	Pa & Ho	UC
	Atretium schistosum	The Olive Keelback	Pa	R
	Boiga trigonata	Gamma Cat Snake	Ho	C
	Cerberus rynchops	Dog faced Watersnake	Mn	UC
	Dendrelaphis tristis	Common Bronzeback	Mn & Sc	UC
	Lycodon aulicus	The Commom Wolf Snake	Sc	R
	Lycodon osmanhilli[E, T]	-	Gr	VR

Family	Scientific Name	Commom Name	Habitat	Relative Abundance
	Lycodon striatus	Shaw's Wolf Snake	Ho & Sc	R
	Oligodon arnensis	Kukri Snake	Sc	UC
	Oligodon taeniolatus	Varigated Kukri Snake	Ho	UC
	Ptyas mucosa	The Common Rat Snake	Pa & Sc	UC
	Xenochrophis asperrimus[E, T]	Commom Pond Snake	Mn & Ma	VR
	Xenochrophis piscator	Checkered Keelback	Pa & Ma	C
Elapidae	*Bungarus caeruleus*	The Common Indian Krait	Pa	UC
	Calliophis melanurus	The Slender Coral Snake	Ho	VR
	Hydrophis cynocinctus	The Chittul	S	C
	Hydrophis gracilis	John's Sea Snake	S	VR
	Hydrophis spiralis	The Narrow-banded sea Snake	S	C
	Naja naja	Cobra	Ho & Pa	UC
Viperidae	*Daboia russelii*	Russell's Viper	Pa & Ho	UC

13 Families, 43 Species, 4 Endemic, 7 Nationally Threatened.

Annex 5

List of birds recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc** - Scrubland; **Gr** - Grassland; **Ew** - Euphorbia woodland; **Rb** - Reed bed; **Mn** - Mangrove; **Sd** - Coastal Sand Dune & Beach; **Ch** - Chena & Home Garden; **Pd** - Paddyfield; **Cp** - Coconut Plantation; **Lg** - Lagoon; **Ms** - Marshland; **Tn** - Freshwater Tank, **Hs** - Hyper saline lagoon

Relative Abundance : **VC** - Very Common; **C** - Common; **UC** - Uncommon; **R** - Rare; **VR** - Very Rare

Status : **E** - Endemic, **T** - Nationally Threatened, **WV** - Wintor Visitor, **V** - Vagrant

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
Accipitridae	*Pernis ptilorhynchus*	Oriental Honey-buzzard	Sc, Mn, Ch	U
Podicipedidae	*Tachybaptus ruficollis*	Little Grebe	Lg, Tn	UC
Pelicanidae	*Pelecanus philippensis*[T]	Spot-billed Pelican	Mn, Tn, Lg, Hs	C
Phalacrocoracidae	*Phalacrocorax carbo*[T]	Great Cormorant	Mn, Tn, Lg	UC
	Phalacrocorax fuscicollis	Indian Cormorant (Indian Shag)	Mn, Tn, Lg, Hs	C
	Phalacrocorax niger	Little Cormorant	Mn, Tn, Lg, Hs, Ms	VC
Anhingidae	*Anhinga melanogaster*	Oriental Darter	Mn, Tn, Lg	C
Ardeidae	*Ardea cinerea*	Grey Heron	Mn, Pd, Tn, Lg, Hs, Ms	C
	Ardea purpurea	Purple Heron	Mn, Pd, Tn, Lg, Ms	C
	Casmerodius albus	Great Egret	Mn, Pd, Tn, Hs, Lg, Ms	C
	Mesophoyx intermedia	Intermediate Egret	Mn, Pd, Hs, Tn, Lg, Ms	C
	Egretta garzetta	Little Egret	Mn, Pd, Hs, Tn, Lg, Ms	VC
	Egretta gularis[WV]	Western Reef Egret	Lg, Sd	R
	Bubulcus ibis	Cattle Egret	Gr, Mn, Pd, Hs, Tn, Lg, Ms	VC
	Ardeola grayii	Indian Pond Heron	Gr, Mn, Pd, Hs, Tn, Lg, Ms	VC
	Butorides striatus	Striated Heron (Little Green Heron)	Mn, Lg, Hs, Ms	C
	Nycticorax nycticorax	Black-crowned Night Heron	Mn, Pd, Tn, Lg, Ms	C
	Ixobrychus sinensis	Yellow Bittern	Mn, Lg, Ms	UC
	Ixobrychus cinnamomeus	Cinnamon Bittern (Chestnut Bittern)	Mn, Lg, Ms	UC
	Ixobrychus flavicollis	Black Bittern	Mn, Lg, Ms	UC
Ciconiidae	*Mycteria leucocephala*	Painted Stork	Tn, Lg, Hs, Ms	C
	Anastomus oscitans	Asian Openbill	Mn, Pd, Tn, Lg, Hs, Ms	C
Threskiornithidae	*Threskiornis melanocephalus*	Black-headed Ibis (White Ibis)	Mn, Pd, Tn, Lg, Ms	C
	Plegadis falcinellus[WV]	Glossy Ibis	Ms	R
	Platalea leucorodia	Eurasian Spoonbill	Mn, Lg, Ms	U
Anatidae	*Dendrocygna javanica*	Lesser Whistling Duck (Whistling Teal)	Tn, Lg, Hs, Ms	C
	Anas acuta[WV]	Northern Pintail	Lg, Ms	C
	Anas querquedula[WV]	Garganey	Lg, Ms	VC
Accipitridae	*Pernis ptilorhynchus*	Oriental Honey-buzzard	Sc, Mn, Ch	U

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
	Haliastur indus	Brahminy Kite	Sc, Mn, Ch, Pd, Tn, Lg, Hs, Ms	C
	Haliaeetus leucogaster	White-bellied Fish Eagle	Mn, Tn, Lg, Hs, Ms	C
	Ichthyophaga ichthyaetus	Grey-headed Fish Eagle	Tn, Lg	R
	Spilornis cheela	Crested Serpent Eagle	Sc, Mn, Ch, Ew, Lg, Ms	C
	Circus pygargus	Montagu's Harrier	Sc, Mn, Lg	UC
	Circus aeruginosus[WV]	Western Marsh Harrier	Mn, Lg, Ms	UC
	Accipiter badius	Shikra	Sc, Mn, Cp, Ch	C
	Hieraaetus pennatus[WV]	Booted Eagle	Sc	VR
Falconidae	*Falco peregrinus*[WV]	Peregrine Falcon	Cp	VR
Phasianidae	*Gallus lafayettii*[E]	Sri Lanka Jungle Fowl	Gr, Sc, Mn, Cp, Ch, Ew	VC
	Pavo cristatus	Indian Peafowl	Gr, Sd, Sc, Mn, Cp, Ch, Pd, Ew	C
Rallidae	*Porzana fusca*[T]	Ruddy-breasted Crake	Mn, Ms	VR
	Amaurornis phoenicurus	White-breasted Waterhen	Mn, Pd, Tn, Lg, Hs, Ms	VC
	Gallinula chloropus	Common Moorhen	Lg, Tn, Ms	R
	Porphyrio porphyrio	Purple Swamp Hen (Purple Coot)	Pd, Tn, Lg, Ms	C
Jacanidae	*Hydrophasianus chirurgus*	Pheasant-tailed Jacana	Tn, Lg, Ms	C
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	Mn, Tn, Lg, Hs, Ms	VC
Burhinidae	*Burhinus oedicnemus*	Eurasian Thick-knee (Stone Curlew)	Gr, Sd, Sc, Tn, Lg, Hs, Ms	C
	Esacus recurvirostris[T]	Great Thick-knee	Gr, Sd, Tn, Lg, Hs, Ms	C
Glareolidae	*Glareola maldivarum*	Oriental Pratincole	Gr, Ms	R
Charadriidae	*Vanellus malabaricus*[T]	Yellow-wattled Lapwing	Gr, Sc, Mn, Tn, Lg, Hs, Ms	C
	Vanellus indicus	Red-wattled Lapwing	Gr, Sc, Mn, Pd, Tn, Lg, Hs, Ms	C
	Pluvialis fulva[WV]	Pacific Golden Plover	Gr, Mn, Pd, Tn, Lg, Hs, Ms	C
	Pluvialis squatarola[WV]	Grey Plover	Lg, Hs, Ms	UC
	Charadrius hiaticula[V]	Common Ringed Plover	Gr, Lg, Ms	VR
	Charadrius dubius	Little Ringed Plover	Tn, Lg, Hs, Ms	R
	Charadrius alexandrinus	Kentish Plover	Tn, Lg, Hs, Ms	R
	Charadrius mongolus[WV]	Mongolian Plover (Lesser Sand Plover)	Gr, Mn, Pd, Tn, Lg, Hs, Ms	VC
	Charadrius leschenaultii[WV]	Greater Sand Plover	Tn, Lg, Hs, Ms	UC
Scolopacidae	*Limosa limosa*[WV]	Black-tailed Godwit	Lg, Hs, Ms	VC
	Numenius phaeopus[WV]	Whimbrel	Sd, Pd, Lg, Hs, Ms	UC
	Tringa totanus[WV]	Common Redshank	Mn, Pd, Tn, Hs, Lg, Ms	C
	Tringa stagnatilis[WV]	Marsh Sandpiper	Mn, Pd, Tn, Lg, Hs, Ms	C
	Tringa nebularia[WV]	Common Greenshank	Mn, Pd, Tn, Lg, Hs, Ms	C
	Tringa glareola[WV]	Wood Sandpiper	Mn, Pd, Tn, Lg, Hs, Ms	C
	Actitis Hypoleucos	Common Sandpiper	Gr, Mn, Pd, Tn, Lg, Hs, Ms	C
	Arenaria interpres[WV]	Ruddy Turnstone	Gr, Mn, Tn, Lg, Hs, Ms	C
	Gallinago stenura[WV]	Pintail Snipe	Ms	C
	Calidris minuta[WV]	Little Stint	Mn, Tn, Lg, Hs, Ms	C

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
	Calidris subminuta[WV]	Long-toed Stint	Ms	VR
	Calidris ferruginea[WV]	Curlew Sandpiper	Tn, Lg, Hs, Ms	C
	Philomachus pugnax[WV]	Ruff	Tn, Lg, Hs, Ms	UC
Laridae	*Larus brunnicephalus*[WV]	Brown-headed Gull	Sd, Lg, Hs	R
	Chlidonias hybridus	Whiskered Tern	Sd, Mn, Pd, Tn, Lg, Hs, Ms	VC
	Childonias leucopterus[WV]	White-winged Tern	Lg, Hs	R
	Gelochelidon nilotica	Gull-billed Tern	Sd, Mn, Pd, Tn, Lg, Hs, Ms	C
	Hydroprogne caspia[WV]	Caspian Tern	Sd, Lg, Hs	C
	Sterna hirundo[WV]	Common Tern	Lg, Hs	R
	Sterna albifrons	Little Tern	Lg, Hs	UC
	Sterna saundersi	Saunders's Tern	Sd	UC
	Thalasseus bergii	Great Crested Tern	Sd, Lg, Hs	UC
	Thalasseus bengalensis[WV]	Lesser Crested Tern	Sd, Lg, Hs	UC
	Anous stolidus[V]	Brown Noddy (Common Noddy)	Sd	VR
Columbidae	*Columba livia*	Rock Pigeon (Feral Pigeon)	Gr, Sd, Sc, Cp, Ch, Pd, Ms	VC
	Streptopelia chinensis	Spotted Dove	Gr, Sc, Mn, Cp, Ch, Pd, Ew, Ms	VC
	Treron bicincta	Orange-breasted Green Pigeon	Sc, Mn, Ch	C
	Treron pompadora[E]	Ceylon Green Pigeon	Sc, Mn, Ch	C
Psittacidae	*Psittacula eupatria*	Alexandrine Parakeet (Ceylon Large Parakeet)	Sc, Mn	VR
	Psittacula kramerii	Rose-ringed Parakeet	Sc, Mn, Cp, Ch, Pd	VC
Cuculidae	*Clamator coromandus*[WV]	Chestnut-winged Cuckoo	Mn	R
	Oxylophus jacobinus	Pied Cuckoo (Pied Crested Cuckoo)	Sc, Ew	UC
	Cacomantis merulinus	Plaintive Cuckoo	Sc, Ch	UC
	Eudynamys scolopacea	Asian Koel	Sc, Mn, Ch, Ew	C
	Rhopodytes viridirostris	Blue-faced Malkoha	Sc, Ch	C
	Centropus sinensis	Greater Coucal (Common Coucal)	Sc, Mn, Ch, Ew	C
Strigidae	*Otus bakkamoena*	Collared Scops Owl (Indian Scops Owl)	Sc, Ch	R
	Bubo zeylonensis	Brown Fish Owl	Sd, Sc	R
	Glaucidium radiatum	Jungle Owlet	Sc, Ch	R
Caprimulgidae	*Caprimulgus atripennis*	Jerdon's Nightjar (Long-tailed Nightjar)	Gr, Sd, Sc	UC
	Caprimulgus asiaticus	Indian Nightjar (Common Nightjar)	Gr, Sd, Sc	C
Apodidae	*Aerodramus unicolor*	Indian Swiftlet (Edible-nest Swiftlet)	Gr, Sd, Sc, Mn, Ch	C
	Cypsiurus balasiensis	Asian Palm Swift	Gr, Sd, Sc, Mn, Cp, Ch, Pd, Ew, Ms"	UC

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
	Apus affinis	Little Swift (White-rumped Swift)	Gr, Sc, Ch, Ms	UC
Hemiprocnidae	*Hemiprocne longipennis*	Grey-rumped Treeswift	Sc, Mn, Ch	R
Alcedinidae	*Ceryle rudis*	Pied Kingfisher	Mn, Tn, Lg	UC
	Alcedo atthis	Common Kingfisher	Mn, Tn, Lg, Hs, Ms, Sm	UC
	Halcyon capensis	Stork-billed Kingfisher	Pd, Tn, Lg"	C
	Halcyon smyrnensis	White-throated Kingfisher	Mn, Ch, Pd, Tn, Lg, Ms	C
Meropidae	*Merops orientalis*	Little Green Bee-eater	Gr, Sc, Mn, Ch, Ew	C
	Merops philippinus[WV]	Blue-tailed Bee-eater	Sc, Mn, Ch, Ew, Ms	VC
	Merops leschenaulti	Chestnut-headed Bee-eater	Sc, Mn, Ch	C
Coraciidae	*Coracias benghalensis*	Indian Roller	Sc, Mn, Pr, Pd	C
Capitonidae	*Megalaima zeylanica*	Brown-headed Barbet	Sc, Mn, Pr, Cp, Ch, Ew	VC
	Megalaima haemacephala	Coppersmith Barbet (Crimson-breasted Barbet)	Sc, Ch	R
Picidae	*Picoides moluccensis*	Brown-capped Woodpecker (Pygmy Woodpecker)	Sc, Mn	R
	Picoides mahrattensis	Yellow-crowned Woodpecker	Sc	R
	Dinopium benghalense	Black-rumped Flam eback (Red-backed Woodpecker)	Sc, Mn, Ch, Ew	C
Pittidae	*Pitta brachyura*[WV]	Indian Pitta	Sc, Ch, Ew	C
Alaudidae	*Mirafra assamica*	Rufous-winged Lark	Gr, Sc, Pd	UC
	Alauda gulgula	Oriental Skylark	Gr, Sc, Pd	UC
	Eremopterix grisea	Ashy-crowned Sparrow Lark	Gr, Sc, Pd	VC
Hirundinidae	*Hirundo rustica*[WV]	Barn Swallow (East Asian Swallow)	Gr, Sd, Sc, Mn, Cp, Ch, Pd, Ew, Ms	VC
	Hirundo hyperythra[E]	Ceylon Swallow	Gr, Sc, Cp, Ch	UC
Motacillidae	*Dendronanthus indicus*[WV]	Forest Wagtail	Sc, Ch	UC
	Motacilla flava[WV]	Yellow Wagtail	Gr, Mn, Pd, Ms	C
	Anthus rufulus	Paddyfield Pipit (Indian Pipit)	Gr, Sc	VC
	Anthus godlewskii[WV]	Blyth's Pipit	Gr	VR
Campephagidae	*Coracina melanoptera*	Black-headed Cuckooshrike	Sc, Mn, Ch	UC
	Pericrocotus cinnamomeus	Small Minivet (Little Minivet)	Sc, Mn	UC
	Tephrodornis affinis[E]	Ceylon Woodshrike	Sc, Mn, Ch	C
Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul	Sc, Mn, Cp, Ch, Ew	VC
	Pycnonotus luteolus	White-browed Bulbul	Sc, Mn, Cp, Ch, Ew	VC
Irenidae	*Aegithina tiphia*	Common Iora	Sc, Mn, Ch, Ew	C
	Lanius cristatus[WV]	Brown Shrike	Sc, Mn, Cp, Ch, Ew	C
Turdidae	*Copsychus saularis*	Oriental Magpie Robin (Southern Magpie Robin)	Sc, Mn, Cp, Ch	C

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
	Saxicoloides fulicata	Black-backed Robin (Ceylon Black Robin)	Sc, Ch	C
Timaliidae	*Pellorneum fuscocapillum*[E,T]	Brown-capped Babbler	Sc, Ew	UC
	Dumetia hyperythra	Tawny-bellied Babbler (White-throated Babbler)	Sc, Ew	UC
	Rhopocichla atriceps	Dark-fronted Babbler	Sc, Ch, Ew	C
	Turdoides affinis	Yellow-billed Babbler (Common Babbler)	Gr, Sc, Mn, Cp, Ch, Ew	VC
Sylviidae	*Locustella certhiola*[WV]	Pallas's Grasshopper Warbler	Ms	VR
	Acrocephalus dumetorum[WV]	Blyth's Reed Warbler	Sc, Mn, Ch, Ho, Ew	C
	Acrocephalus stentoreus	Clamorous Reed Warbler	Ms	UC
	Cisticola juncidis	Zitting Cisticola (Streaked Fantail Warbler)	Sc, Pd	C
	Prinia hodgsonii	Grey-breasted Prinia (Franklin's Prinia)	Sc, Mn, Ch, Ew	C
	Prinia sylvatica	Jungle Prinia (Ceylon Large Prinia)	Sc, Cp	UC
	Prinia socialis	Ashy Prinia	Sc, Mn, Ch	UC
	Prinia subflava	Plain Prinia (Ceylon White-browed Prinia)	Sc, Mn, Ch, Pd, Ew	C
	Orthotomus sutorius	Common Tailorbird	Sc, Mn, Cp, Ch, Pd, Ew	VC
	Phylloscopus nitidus[WV]	Bright-green Warbler (Green Tree Warbler)	Sc, Mn	UC
Muscicapidae	*Muscicapa dauurica*[WV]	Asian Brown Flycatcher	Sc, Mn, Ch	UC
Monarchidae	*Terpsiphone paradisi*	Asian Paradise-flycatcher	Sc, Mn, Ch	C
Dicaeidae	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker (Samll Flowerpecker)	Sc, Mn, Ch, Ew	C
Nectariniidae	*Nectarinia zeylonica*	Purple-rumped Sunbird	Sc, Mn, Ch, Ew	VC
	Nectarinia lotenia	Long-billed Sunbird (Loten's Sunbird)	Sc, Mn, Ch, Ho, Ew	C
	Nectarinia asiatica	Purple Sunbird	Sc, Mn, Ch, Ew	VC
Estrildidae	*Lonchura striata*	White-rumped Munia	Sc, Ch, Pd	UC
	Lonchura punctulata	Scaly-breasted Munia (Spotted Munia)	Sc, Mn, Ch, Pd, Tn, Lg, Ms	C
	Lonchura malacca	Black-headed Munia	Sc, Mn, Pd, Tn, Lg, Ms	C
Ploceidae	*Passer domesticus*	House Sparrow	Ch	C
	Ploceus manyar	Streaked Weaver	Sc, Ch, Lg, Ms	UC
	Ploceus philippinus	Baya Weaver	Sc, Mn, Ch, Pd, Ew, Ms	C
Sturnidae	*Sturnus pagodarum*[WV]	Brahminy Starling (Brahminy Myna)	Sc, Mn, Ch	UC
	Sturnus roseus[WV]	Rosy Starling (Rosy Pastor)	Sc, Mn, Cp, Ch, Pd	VC
	Acridotheres tristis	Common Myna	Gr, Sc, Mn,Cp, Ch, Pd, Ew,Tn, Lg, Ms	VC
Oriolidae	*Oriolus xanthornus*	Black-hooded Oriole	Sc, Mn, Cp, Ch	C
Dicruridae	*Dicrurus caerulescens*	White-bellied Drongo	Sc, Ch	C

Family	Scientific Name	Commom Name	Habitat	Relative Abund-ance
	Artamidae	*Artamus fuscus* (Ashy Swallow-shrike)	Ashy Woodswallow Sc, Mn, Cp, Ch, Ew	C
Corvidae	*Corvus splendens*	House Crow (Grey-necked Crow)	Gr, Sc, Mn, Cp, Ch, Pd, Tn, Lg, Hs, Ms	VC
	Corvus macrorhynchos	Large-billed Crow (Jungle / Black Crow)	Gr, Sc, Mn, Cp, Ch, Pd, Tn, Lg, Ms	C

54 Families, 168 Species, 5 Endemic, 5 Nationally Threatened Species, 45 Winter Visitors, 2 Vagrants.

Annex 6

List of mammals recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc -** Scrubland; **Gr -** Grassland; **Ew -** Euphorbia woodland; **Mn -** Mangrove; **Sd -** Coastal Sand Dune & Beach; **Ch -** Chena & Home Garden; **Pd -** Paddyfield; **Cp -** Coconut Plantation; **Wt -** Wetlands.

Relative Abundance : **VC** - Very Common; **C -** Common; **UC -** Uncommon; **R -** Rare; **VR -** Very Rare

Status : **E -** Endemic, **T -** Nationally Threatened

Family	Scientific Name	Commom Name	Habitat	Relative Abundance
Manidae	*Manis crassicaudata*	Pangolin	Sc	R
Soricidae	*Suncus murinus*	Musk Shrew	Sc, Ch	C
Pteropodidae	*Pteropus giganteus*	Common Flying Fox	Sc, Mn, Cp, Ch	VC
Cercopithecidae	*Semnopithecus priam*	Grey Langur	Sc, Mn, Ch, Ew	C
	Macaca sinica[E]	Toque Monkey	Ch	UC
Canidae	*Canis aureus*	Sri Lanka Jackal	Gr, Sc	UC
Felidae	*Prionailurus rubiginosus*[T]	Rusty Spotted Cat	Sc, Wt	VR
	Prionailurus viverrinus[T]	Fishing Cat	Sc, Pd, Wt	UC
Herpestidae	*Herpestes edwardsii*	Grey Mongoose	Gr, Sc, Cp, Ch	UC
	Herpestes smithii	Ruddy Mongoose	Gr, Sc, Mn, Ch, Wt	C
Viverridae	*Viverricula indica*	Small Civet Cat	Gr, Sc, Cp, Ch	C
	Paradoxurus hermaphoditus	Indian Palm Cat	Sc, Cp, Ch	C
Mustelidae	*Lutra lutra*[T]	Indian otter	Mn, Wt	R
Bovidae	*Bubalus bubalis*	Indian Water Buffalo	Gr, Sc, Mn, Pd, Wt	VC
Suidae	*Sus scrofa*	Wild Boar	Gr, Sc, Mn, Wt	UC
Tragulidae	*Moschiola meminna*[E]	Mouse Deer	Gr, Sc, Ch	C
Hystricidae	*Hystrix indica*	Indian Crested Porcupine	Sc, Mn, Cp, Ch	UC
Muridae	*Tatera indica*	Gerbil	Gr, Sc, Cp, Ch, Ew	VC
	Mus musculus	House Mouse	Ch	C
	Rattus rattus	House Rat	Sc, Cp, Ch	C
	Rattus norvegicus	Brown Rat	Cp, Ch	VC
Sciuridae	*Funambulus palmarum*	Palm Squirrel	Sc, Mn, Cp, Ch, Ew	VC
	Ratufa macroura	Giant Squirrel	Sc, Ch	R
Leporidae	*Lepus nigricollis*	Black Naped Hare	Gr, Sc, Cp, Ch, Ew	VC

16 Families, 24 Species, 2 Endemic, 3 Nationally Threatened.

Annex 7

List of butterflies recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc -** Scrubland; **Gs -** Grassland; **Ew -** Euphorbia woodland; **Rb -** Reed bed; **Mn -** Mangrove; **Sd -** Coastal Sand Dune & Beach; **Ch -** Chena & Home Garden; **Pd -** Paddyfield; **Cp -** Coconut Plantation; **Lg -** Lagoon; **Ms -** Marshland; **Tn -** Freshwater Tank, **Nl -** Natural Lewaya

Relative Abundance : **VC -** Very Common; **C -** Common; **UC -** Uncommon; **R -** Rare; **VR -** Very Rare

Status : **E -** Endemic, **T -** Nationally Threatened, **DD -** Data deficient

Family	Scientific Name	Commom Name	Habitat	Relative Abun-dance
Papilionidae	*Troides darsius* [E,T]	Common Birdwing	Sd,	VR
	Pachliopta hector	Crimson Rose	Gr,Sd,Sc,Cp,Ch,Pd	C
	Pachliopta aristolochiae	Common Rose	Sc,Ch	UC
	Papilio crino	Banded Peacock	Ch	VR
	Papilio demoleus	Lime Butterfly	Sc,Ch,Pd	C
	Papilio polytes	Common Mormon	Gr,Sc,Ch,	UC
	Papilio polymnestor	Blue Mormon	Sc,Cp,Ch	UC
	Graphium agamemnon	Tailed Jay	Ch	UC
Pieridae	*Leptosia nina*	Psyche	Sc,Cp,Ch,Mn,Ew	VC
	Delias eucharis	Jezebel	Gr,Sc,Cp,Ch,Pd	C
	Belenois aurota	Pioneer	Gr,Sd,Sc,Cp,Ch,Pd, Mn,Ew	VC
	Cepora nerissa	Common Gull	Gr,Sd,Sc,Cp,Ch,Pd,Ew	C
	Appias libythea [T]	Striped Albatross	Mn,Sc	UC
	Appias paulina [T]	Lesser Albatross	Pd,Mn	R
	Ixias marianne	White Orange Tip	Gr,Sc,Cp,Ch,Ew	C
	Ixias pyrene	Yellow Orange Tip	Gr,Sd,Sc,Cp,Ch,Pd,Ew	VC
	Hebomoia glaucippe	Great Orange Tip	Sc,Cp,Ho,Pd,Ew	UC
	Catopsilia pyranthe	Mottled Immigrant	Gr,Sd,Sc,Cp,Ch,Pd, Mn,Ew	VC
	Catopsilia pomona	Lemon Migrant	Gr,Sd,Sc,Cp,Ch,Pd, Mn,Ew	VC
	Pareronia ceylanica	Dark Wanderer	Sc,Mn,Ew	UC
	Colotis amata	Small Salmon Arab	Gr,Sd,Sc,Cp,Ch,Pd, Mn,Ew	VC
	Colotis etrida	Little Orange Tip	Gr,Sc,Ch,Ew	C
	Eurema brigitta	Small Grass Yellow	Gr,Sc,Cp,Ch,Pd,Ew	C
	Eurema hecabe	Common Grass Yellow	Gr,Sc,Cp,Pd,	UC
Nymphalidae	*Tirumala limniace*	Blue Tiger	Gr,Sd,Sc,Cp,Ch,Ew	C
	Tirumala septentrionis	Dark Blue Tiger	Cp,Pd,Ew	UC

Family	Scientific Name	Commom Name	Habitat	Relative Abun-dance
	Parantica aglea	Glassy Tiger	Sd,Sc,Cp,Ch,Mn,Ew	C
	Danaus chrysippus	Plain Tiger	Gr,Sd,Sc,Cp,Ch,Pd,Ew	C
	Danaus genutia	Common Tiger	Gr,Sd,Sc,Cp,Ch,Pd,Ew	C
	Euploea core	Common Crow	Gr,Sd,Sc,Cp,Ch,Pd, Mn,Ew	C
	Euploea sylvester	Double-banded Crow	Sc,Cp,	UC
	Ariadne ariadne	Angled Castor	Gr,Sd,Sc,Cp,Ch,Pd	UC
	Cethosia nietneri	Ceylon Lace Wing	Sc	R
	Phalanta phalantha	Common Leopard	Gr,Sc,Cp,Ch,Ew	C
	Junonia lemonias	Lemon Pansy	Sc,Cp,Ch,Pd,	C
	Junonia iphita	Chocolate Soldier	Sc,Cp,Ew	UC
	Junonia almana	Peacock Pansy	Sc,Cp,Ch,Pd	UC
	Hypolimnas bolina	Great Eggfly	Sc,Cp,Ch,Ew	UC
	Hypolimnas misippus	Danaid Eggfly	Cp,Ch,Ew	R
	Neptis hylas	Common Sailor	Sc,Ch,Pd,Ew	R
	Euthalia aconthea	Baron	Ch,Ew	R
	Orsotriaena medus	Nigger	Ho,Ew	UC
	Mycalesis persius	Common Bushbrown	Sc,Ew	UC
	Ypthima ceylonica	White Four-ring	Cp,Ho,Ew	UC
	Acraea violae	Tawny Coster	Gr,Sd,Sc,Cp,Ch,Pd,Ew	C
	Melanitis leda	Common Evening Brown	Sc,Ew	UC
	Elymnias hypermnestra	Common Palmfly	Sc,Cp,Ch,Pd,Ew	UC
Lycaenidae	*Spalgis epeus*[T]	Apefly	Sc	R
	Curetis thetis	Indian Sunbeam	Mn,	VR
	Arhopala pseudocentaurus[T]	Centaur Oakblue	Sc,Mn	R
	Zesius chrysomallus [T]	Redspot	Mn,Sc,Ch,	R
	Spindasis vulcanus [T]	Common Silverline	Sc,Cp,Ch,Ew,	UC
	Tajuria cippus	Peacock Royal	Sc	VR
	Prosotas nora	Common Lineblue	Sc,Ch,	R
	Jamides celano	Common Cerulian	Sc	R
	Jamides bochus	Dark Cerulean	Sc	R
	Catochysops strabo	Forget-me-not	Gr,Sc,Cp,Ch,Ew,	VC
	Lamides boeticus	Pea Blue	Gr,Sc,Cp,Ch,	UC
	Syntrucus plinius	Zebra Blue	Gr,Sc,Cp,Ch,	UC
	Castalius rosimon	Common Pierrot	Gr,Sc,Cp,Ch,Ew	C
	Discolampa ethion[T]	Banded Blue Pierrot	Sc	UC
	Tarucus callinara[DD]	Butler's Spotted Pierrot	Gr,Sc,Cp,Ch,Ew,	C
	Freyeria trochilus	Grass Jewel	Gr,Sc,Cp,Ch,Ew,	UC
	Zizeeria karsandra[T]	Dark Grass Blue	Gr,Sc,Ch,	UC
	Zizina otis	Lesser Grass Blue	Gr,Sc,Cp,Ch,Pd,Ew	C
	Zizula hylax [T]	Tiny Grass Blue	Gr,Sc,Cp,Ch,Pd,Ew	C

Family	Scientific Name	Commom Name	Habitat	Relative Abun-dance
	Talicada nysews	Red Pierrot	Sc,Ew,	UC
	Azanus jesous [T]	African Babul Blue	Gr,Sc,Cp,Ch,Ew	C
	Chilades lajus	Lime Blue	Sc,Cp,Ch	R
	Everes lacturnus	Indian Cupid	Gr,Sc,	R
Hesperiidae	*Ampittia dioscorides*	Bush Hopper	Ch,Sc,Cp,Pd,Ew	UC
	Iambrix salsala	Chestnut Bob	Ch	UC
	Spalia galba	Indian Skipper	Ch,Sc	R
	Pelopidas mathias	Small Branded swift	Pd	R
	Telicota ancilla[T]	Dark Palm Dart	Sc, Ch	R

5 Families, 75 Species, 1 Endemic, 12 Nationally Threatened

Annex 8

List of terrestrial & aquatic molluscs recorded in the Lunama-Kalametiya wetland Sanctuary

Habitat : **Sc** - Scrubland; **Gr** - Grassland; **Ew** - Euphorbia woodland; **Mn** - Mangrove; **Sd** - Coastal Sand Dune & Beach; **Ch** - Chena & Home Garden; **Pd** - Paddyfield; **Cp** - Coconut Plantation; **Wt** - Wetlands.

Relative Abundance : **VC** - Very Common; **C** - Common; **UC** - Uncommon; **R** - Rare; **VR** - Very Rare

Status : **E** - Endemic, **T** - Nationally Threatened

(a) Terrestrial Molluscs in Lunama-Kalametiya wetland system

Family	Species	Habitat	Relative Abundance
Ariophantidae	*Sitala phyllophila*[E]	Ch	R-1st Record from the area
Glessulidae	*Glessula* Sp.1	Sc	R
Subulinidae	*Subulina octona*	Sc,Pr,Ch	VC
	Allopeas gracile	Ho,Sc,Pr,Ch	VC
Achatinidae	*Achatina fulica*	Ch, Pd, Cp	C
Acavidae	*Acavus haemastoma*[E;T]	Cp	VR-Recorded from two shell only
	Oligospira polei[E;T]	Sc	VR-Recorded from two shell only
Camaenidae	*Beddomea trifasciatus*[E]	Sc	R
Cyclophoridae	*Cyclophorus menkeanus*	Sc	VR-Recorded from two shell only
	Japonia occulta[E]	Gr,Sc,Cp,Ch	VC

(b) Aquatic molluscs in Lunama-Kalametiya wetland system

Family	Species	Habitat	Relative Abundance
Ampullariidae	*Pila globosa*	Pd,Wt	C
	Pila Sp.1	Pd,Wt	C
Bithynidae	*Bithynia stenothyroides*	Pd,Wt	C
Planorbidae	*Gyraulus hyptiocyclos*	Gr,Mn	C
Lymnaeidae	*Lymnaea luteola*	Pd,Wt	C
Thiaridae	*Melanoides torulosa*	Wt	C
	Melanoides tuberculata	Pd	C
	Thiara scabra	Wt	C

Terretrial molluscs
7 Families, 10 Species, 5 Endemic, 2 Nationally Threatened.

Aquatic molluscs
5 Families, 8 Species.

Literature Cited

Ackery, P., de Jong R. and Vane-Wright R.I. (1999), The Butterflies: Hedyloidea, Hesperoidea and Papilionoidae. In Lepidoptera, Moths and Butterflies. 1. Evolution, Systematics and Biogeography. Handbook of Zoology 4 (35) 263 - 300 (ed. N.P. Kristensen). Berlin: de Gruyter.

Amarasooriya, K.D. (2000). Classification of Sea Turtle Nesting Beaches of Southern Sri Lanka. Proceedings of the Second ASEAN Symposium and Workshop on Sea Turtle Biology and Conservation, 228-236 pp.

Anonymous (2000). Conservation Management Plan for 10 selected mangrove habitats South of Colombo, Sri Lanka. Unpublished report prepared by IUCN - The World Conservation Union, Sri Lanka.

CEA/Euroconsult (1995). Wetland Site Report and Conservation Management Plan: Kalametiya and Lunama Lagoons. Central Environmental Authority, Sri Lanka & Euroconsult, Netherlands, 83 pp.

D'Abreira, B. (1998). *The butterflies of Ceylon*. Wildlife Heritage Trust, Colombo, Sri Lanka. 221 pp.

De Bruin, G.H.P., Russel, B. C., Bogusch, A. (1994). The marine fishery resources of Sri Lanka. FAO, Rome.

Dassanayake, M. D. & Fosberg, F. R. (eds.) (1980 - 1991). *Revised handbook to the flora of Ceylon*, Vols. I-VII. Amerind Publ., New Delhi.

Dassanayake, M. D., and Clayton, W. D. (eds.) (1996 - 1999). *Revised handbook to the flora of Ceylon*, Vols. X - XIII. Amerind Publ., New Delhi.

Dassanayake, M. D., Fosberg, F. R. and Clayton, W. D. (eds.) (1994 - 1995). *Revised handbook to the flora of Ceylon*, Vols. VII - IX. Amerind Publ., New Delhi.

De Silva, A. (1990). *Colour guide to the snakes of Sri Lanka.* R & A publishing Ltd, Avon, England, 130 pp.

Dubois A. & Ohler A. (1999) Asian and Oriental toads of the *Bufo melanistictus, Bufo scaber* and *Bufo stejnegeri* groups (Amphibia: Anura): A list of available and valid names and redescription of some name bearing types; Journal of South Asian Natural History: Vol. 04, No. 2, pp. 133-180.

Dutta, S.K. & Manamendra-Arachchi, K. (1996). *The amphibian fauna of Sri Lanka.* The Wild life Heritage Trust, Sri Lanka, 230 pp.

Groves C. P. & Meijaard (2005). Interspecific variation in *Maschiola,* The Indian Chevrotain, The Raffles Bulletin of Zoology, Supplement No. 12: 413-421.

Harrison, J. & Worfolk, T. (1999). *A field guide to the birds of Sri Lanka.* Oxford University Press.

Henry, G. M. (1978). *A guide to the birds of Ceylon* (2nd ed.). K.V.G. de Silva & sons, Kandy, Sri Lanka, 457 pp.

HICZMP (2000a). Environmentally sensitive areas in the Hambanthota Coastal Zone. HICZMP Output 4, Unpublished Report, 37 pp.

HICZMP (2000b). Environmental impacts from development activities in the Hambantota Coastal Zone, HICZMP Output 5, Unpublished Report, 38 pp.

IUCN Sri Lanka (2000). *The 1999 list of threatened fauna and flora of Sri Lanka.* IUCN Sri Lanka, Colombo.114 pp.

Naggs F. & Raheem D. (2000) Land Snail Diversity in Sri Lanka, Natural History Museum, London

Naggs F. (1996) A coloured Guide to the Land and Fresh Water Mollusca of Sri Lanka, Prepared for the 1996 University of Colombo Work shop on the Taxonomy and the identification of Sri Lanka Mollusca. Natural History Museum, London.

Pethiyagoda, R. (1991). *Freshwater fishes of Sri Lanka.* Wildlife Heritage Trust.

Phillips, W. W. A. (1980). *Manual of the mammals of Sri Lanka.* (Part I, II & III) Wildlife and Nature Protection Society, Sri Lanka.

Rasmussem, P. C. & Anderton J. C. (2005) Birds of South Asia. The Ripley Guide. Vols 1 and 2. Smithsonian Institution and tynx Edicions, Washington, D. C. and Barcelona.

Senaratna, L.K. (2001) A check list of the flowering plants of Sri Lanka. National Science Foundation of Sri Lanka.

Sutherland, W.J., 1996, Ecological census techniques, Cambridge University press, UK.

Scott, D. A. (1989). A directory of Asian Wetlands. IUCN, Gland, Switzerland.

Wilson, D.E. & D.A.M. Reeder (1993). Mammal species of the World: A taxonomic and geographic reference. Smithsonian Institution Press, London.