

# Information Sheet on Ramsar Wetlands (RIS)

*Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties]*

**Note: It is important that you read the accompanying Explanatory Note and Guidelines document before completing this form.**

- Date this sheet was updated:** 19<sup>th</sup> August 2002.
- Country:** India
- Name of wetland:** VEMBANAD-KOL WETLAND
- Geographical coordinates:** 09<sup>o</sup> 00' – 10<sup>o</sup> 40' N Latitude and 76<sup>o</sup> 00' -77<sup>o</sup> 30' E Longitude  
South West Coast of India
- Elevation:** (average and/or maximum and minimum): 0.6 – 2.2 m below MSL
- Area:** (in hectares): 151250 ha
- Overview:** (general summary, in two or three sentences, of the wetland's principal characteristics)

The Vembanad-Kol Wetland System is the largest brackish, humid tropical wetland ecosystem in the Southwest coast of India. The wetland regularly supports 20,000 residential/migratory waterbirds, , general of prawns, fishes and mangroves. Most significant values include flood occlusion, fishery, lime shellfishery, rice production, pollution abatement, inland navigation, port facility (Cochin Port) and breakwater tourism.

**8. Wetland Type:** (please circle the applicable codes for wetland types as listed in Annex I of the Explanatory Note and Guidelines document)

<i>marine-coastal:</i>	A	B	C	D	E	<input checked="" type="checkbox"/> F	G	H	<input checked="" type="checkbox"/> I	J	K	Zk(a)
<b>Inland:</b>	L	M	N	O	P	Q	R	Sp	Ss	Tp	Ts	
	U	Va	Vt	W	Xf	Xp	Y	Zg	Zk(b)			
<b>Human-made:</b>	1	2	3	4	5	6	7	8	9	Zk(c)		

**Please now rank these wetland types by listing them from the most to the least dominant:**  
F,I

**9. Ramsar Criteria:** (please circle the applicable criteria; see point 12 below)

1       2      3       4       5      6      7       8

**Please specify the most significant criterion applicable to this site: 5**

**10. Map of site included?** Please tick YES --or-- NO

(Please refer to the *Explanatory Note and Guidelines* document for information regarding desirable map traits.)

Yes

**11. Name and address of the compiler of this form:**

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Secretariat, 172-B, Lodi Estate  
New Delhi- 110 003  
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**12. Justification of the criteria selected under point 9, on previous page. (Please refer to Annex II in the Explanatory Note and Guidelines document).**

**(i) Criterion 1:**

Vembanad Kol wetland system fed by 10 rivers, covering an area of 1512 km<sup>2</sup>, forms a typical and one of the largest estuarine systems of the western coastal wetland systems. It is renowned for its live clam resources and Sub-Fossil deposits.

**(ii) Criterion 2:**

The wetland supports vulnerable species Spot-billed pelican (*Pelicanus philippensis*).

**(iii) Criterion 4:**

The Vembanad supports the third largest population of waterfowl in India during the winter months. 91 species of resident/locally migratory and 50 species of migratory birds are found in the Kol area. The wealth of bird species, which visit the Vembanad Kol wetland systems, is given in Table 4, 5 & 6. The birds came here from different regions they stay here for breeding and feeding.

**(iv) Criterion 5:**

The Vembanad supports the third largest population of waterfowl more than 20,000 in India. According to the Asian Waterfowl Census 1994-96, Vembanad Lake supported 27 species 29,991 waterbirds in 1994; 33 species 21,416 waterbirds in 1995 and 35 species 21,724 waterbirds in 1996.

**(v) Criterion 8:**

Vembanad serves as a habitat for variety of finfish, shellfish, a nursery of several species of aquatic life, and a transitional ecotone between sea and land. Many fish species depend on the wetland for food, spawning and nursery.

**13. General location: (include the nearest large town and its administrative region).**

Alappuzha, Kochi and Thrissur towns which falls within Alappuzha, Ernakulam, and Thrissur districts of Kerala State respectively.

- 14. Physical features:** (e.g. Geology, geomorphology; origins — natural or artificial; hydrology; soil type; water quality; water depth water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate).

Geologically the area is having Crystalline rocks in higher reaches; Tertiary sedimentary rocks; laterite capping over crystalline and sedimentary rocks, mainly in the middle reaches. Recent & sub recent sediments in low-lying areas and river valleys. The drainage basins may be divided physiographically into three near-parallel north-south zones, viz. the highland (above 75 m above sea level), the middle reaches (7.5 m – 75 m above sea level) and the lowland (below 7.5 m above sea level). Vembanad Kol wetland system fed by 10 rivers, all these rivers originate from the Western Ghats, flow westwards through the wetland system and join the Lakshadweep / Arabian Sea. The wetland is typically divided into two distinct segments viz. The freshwater dominant southern zone and the salt water dominant northern zone. The area receives the full benefit of the southwest monsoon. The estuarine zone and organically rich sedimentary substratum of the inshore region makes it a highly preferred and desirable habitat for shrimps breeding. Vembanad is renowned for its live clam resources and sub-fossil deposits. Riverine alluvium in flood plains of rivers and coastal alluvium in the coastal belt patches of black soil found in certain locations. Mean annual temperature is 24.2<sup>0</sup>C.

- 15. Hydrological values:** (groundwater recharge, flood control, sediment trapping, shoreline stabilization etc.)

These canals offer immense navigational facilities to the local people. Besides continuous flow in the river, the area is also exposed to diurnal tidal cycles. The Vembanad-Kol wetland system has several functions and values. This water body contains the flood waters and saves about 3500 sq km thickly populated coastal area of 3 districts of Kerala from flood damages. The Vembanad lake has a major role to play as (1) an being a sink for 10 rivers acts as an effective aquifer for the dug wells in the neighbouring areas which supplies drinking water to the people, (2) this region is faced with south westerly monsoon floods, being one large sink and transition between Arabian sea and main land acts as a flood control system of the entire area, (3) a gigantic filter and flush out mechanism of the pollutants, (4) a means of sustenance for a very large number of fishermen and coir processors.

- 16. Ecological features:** (main habitats and vegetation types)

Vembanad serves as a habitat for variety of fin fish, shell fish, a nursery of several species of aquatic life, and a transitional ecotone between sea and land. Prawn culture is also popular in several areas of the wetland. The wetland along with the lower reaches of the rivers draining into it serves the purpose of inland navigation. This wetland system also serves as a sink and transformer for the agricultural and municipal wastes discharged into it. The whole area was originally occupied by mangrove swamps, with *Rhizophora apiculata*, *Derris heterophylla*, *Sonneratia alba*, *Acanthus ilicifolius*, *Acrostichum aureum*, and *Cerbera manghas*. Agriculture and fisheries in the wetland are considered to be conflicting values Rice cultivation is practiced in the polders covering a total area of 100 sq km in the Kuttanad belt - the rice bowl of Kerala – of the Vembanad and most of the area of the Kol; the yield of rice from the wetland is 4-6 times more than the uplands.

For detailed list see Appendix III, IV.

17. **Noteworthy flora:** (indicating eg. Which species/communities are unique, rare, endangered or biogeographically important etc):

Mangrove vegetation at Kumarakom, Vypeen, Kannamali and Chettuva. Rare species: *Excoecaria agallocha*, *Bruguiera sexangula*. List given in Table 1 & 2.

18. **Noteworthy fauna:** (indicating eg. Which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

Avifauna — both resident and migratory waterfowl abundant. Endangered species of water fowl are: (1) Spot-billed Pelican (*Pelicanus philippensis*); (2) Oriental Darter (*Anlinga melanogaster*); (3) Water Cock (*Galliere cincera*) & (4) Black-billed Tern (*Sterna malnogaster*).  
(See Appendix IV)

19. **Social and cultural values:** (eg. Fisheries production, forestry, religious importance, archaeological site etc.)

Retting and coir production is a major cottage industry in Vaikom area especially in the Chembu Panchayat. The polluted waters produced in numerous pits as a result of retting flows out into the Chembu Kayal and get drained into the sea, thereby cleaning the inland water tracts substantially. Similarly the effluents of Hindustan Paper Corporation Limited which is a major paper factory located on the banks of the Muvattupuzha river, emptied into this river, finally reach Chembu kayal and get flushed out into the Lakshadweep sea. Live clam collection is a major occupation of women and children in the area. They fetch a good harvest from the area. The meat and shell have good market too. The meat forms a cheap protein food of the poor men of the locality. About 50 tonnes of clam shells are being exported daily to different markets, both inside and outside of Kerala. The clam shells of this area is heavy when compared to that in nearby regions and are extra rich in calcium carbonate.

There are number of Chinese net units which are functioning very well in the area. Besides this, there are a large number of stake nets in this region. Country canoes represent the only fishing craft in the region. The common gears used are Koruvala, Vattavala, Vattivala, Oonnuvala, Odakkuvala, Veesuvala, Kaivala and Cheenavala. Country canoes with arched roof (Kettuvallam with valapura) are also used for transporting materials like sand, coconut husk, coir, household items, agricultural products, fishes, clams, shells etc. from and towards Chembu. Thus the shore occupies an important place as a trading centre and the entire population of the village is directly or indirectly depended on this eco-system. The free services derived by man from this water body for generations need appreciation from Planners and Administrators.

20. **Land tenure/ownership of:**

- (a) Site: wetland - Kerala State Govt.
- (b) Paddy fields - Private ownership
- © Surrounding area – Private ownership

- 21. Current land use:**
- (a) Site – Fishery, coir retting, lime shell fishery
  - (b) Surrounding catchment – Rice cultivation/plantation crops (mainly coconut palms), industries
- 22. Factors:** (past, present or potential) adversely affecting the site’s ecological character, including changes in land use and development projects: (a) at the site (b) around the site
- (a) Site:
    - (i) Land reclamation, pollution due to industrial effluents, agrochemicals, sewage, etc.
    - (ii) Lime shell fishery – Over extraction of lime shell
  - (b) Around the site: agriculture-use of overdose of agrochemicals
- 23. Conservation measures taken:** (national category and legal status of protected areas — including any boundary changes which have been made; management practices; whether an officially approved management plan exists and whether it has been implemented)

There are three completed and five partially completed major-medium irrigation projects in these river basins, which have a total storage capacity of 1,345 Mm<sup>3</sup> to cater to the irrigation requirements of 1,00,000 ha. The nine hydel projects in the river basins contribute to 1400 MW of the installed capacity.

- 24. Conservation measures proposed but not yet implemented:** eg. management plan in preparation; officially proposed as a protected area etc.)

The major management practices in the river basins, aiming at the wise use of the Kol, should concentrate on augmenting the lowflows during the summer crop period and prevention of floods mainly during the south-west monsoon period. One of the irrigation projects, presently under construction, is intended exclusively for enabling the cultivation of rice during summer in the Kol. There are two important aspects to be given stress: (i) develop a scientific operation policy for the reservoirs in the basin; and (ii) provide water from the reservoirs for drinking water purposes in the wetland. In order to manage the floods, it is suggested that: (i) more storage facilities may be created in the river basins; (ii) appropriate drainage channels have to be constructed; and (iii) proper barriers are required to prevent sea water intrusion. The proposed regulators at two locations have to be constructed to prevent excessive salinity intrusion. The application of agro-chemicals has to be reduced; this is important to keep up the ecological status of the wetland and to save the habitat of a large-scale avian fauna. The potential for improving agro-fishery systems has to be looked into.

In Vembanad wetland, lowflow augmentation measures and flood protection are expected to double the rice production. The Thanneermukkom barrier, intended for arresting salinity into the rice fields, has adversely affected the prawn, clam and estuarine fisheries activities. The operation of the barrier has to be scientifically done. The use of agro-chemicals has to be reduced and the domestic/municipal wastewaters entering into the wetland have to be initially treated. It is both economical and ecologically safe to go for one summer crop of rice and one crop of prawn every year. The development of inland navigation and tourism has to be initiated without causing problems to the health of the ecosystem. By adopting appropriate catchment treatment measures, sediment load into the wetland can be considerably reduced.

25. **Current scientific research and facilities:** (eg details of current projects, existence of field station etc.)

NIL

26. **Current conservation education:** (eg visitors centre, hides, information booklet, facilities for school visits etc.)

NIL

27. **Current recreation and tourism:** (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

Wetland has great value from the point of view of water sports; the famous boat race of Kerala takes place in the Vembanad backwaters.

28. **Jurisdiction** (territorial eg state/region and functional eg Dept of Agriculture/Dept of Environment etc.)

State Govt. of Kerala

29. **Management authority:** (name and address of local body directly responsible for managing the wetland)

State Govt. of Kerala (Alappuzha, Kochi and Thrissur; which falls within Alappuzha, Ernakulam and Thrissur districts of Kerala State respectively)

30. **Bibliographical references:** (scientific/technical only)

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**Table1. DISTRIBUTION OF MANGROVES**

S. No.	Species	Family	Distribution	
			South	North
SHRUBS				
1.	<i>Acanthus ilicifolius L.</i>	Acanthaceae	VC	VC
2.	<i>Acrostichum aureum L.</i>	Pteridaceae	VC	VC
LARGE SHRUBS				
3.	<i>Lumnitzera racemosa Willd.</i>	Combretaceae	VR	A
CLIMBING SHRUBS				
4.	<i>Derris trifoliata Lour</i>	Papilionaceae	VC	VC
SMALL TREES				
5.	<i>Aegiceras corniculatum (L.) Blanco</i>	Myrsinae	O	VC
6.	<i>Avicennia marina (Forsk.) Vierh.</i>	Avicenniaceae	R	VC
7.	<i>Bruguiera cylindrical (L.) Bl.</i>	Rhizophoraceae	VR	R
8.	<i>B.sexangula (Lour.) Poir</i>	Rhizophoraceae	VR	VC
9.	<i>Ceriops tagal (Perr.) C.B.Rob</i>	Rhizophoraceae	VR	VR
10.	<i>Kandelia candel (L.) Druce</i>	Rhizophoraceae	R	C
11.	<i>Rhizophora apiculata Blume</i>	Rhizophoraceae	C	C
12.	<i>R.mucronata Lamk.</i>	Rhizophoraceae	VR	C
13.	<i>Excoecaria agallocha L.</i>	Euphorblaceae	C	VC
MEDIUM SIZED TREES				
14.	<i>Avicennia officinalis L.</i>	Avicenniaceae	VC	VC
15.	<i>Excoecaria indica (Wild) Muell.Arg.</i>	Euphorblaceae	R	R
16.	<i>Sonneratia caseolaris (L.) Engl.</i>	Sonneratiaceae	C	O
LARGE TREES				
17	<i>Bruguiera parviflora W.&amp;A.ex Griffith</i>	Rhizophoracea	Vc	VC
R – Rare		VR – Very Rare	VC – Very Common	
C – Common		O – Occasional	A – Absent	

**TABLE 2. DISTRIBUTION OF MANGROVE ASSOCIATES**

Sl.No.	Species	Family	Distribution	
			South	North
<b>HERBS</b>				
1	<i>Alternanthera sessilis</i> (L.) R. Br. Ex. DC	Amaranthaceae	C	O
2	<i>Crinum deflexum</i> Ker.	Amaryllidaceae	C	R
3	<i>Cyperus alopecuroides</i> Rottb.	Cyperaceae	R	A
4	<i>Cyperus</i> sp.	Cyperaceae	C	C
5	<i>Fimbristylis dichotoma</i> Vahl.	Cyperaceae	C	R
6	<i>F. spathacea</i> Roth.	Cyperaceae	C	R
7	<i>Paspalum vaginarum</i> S.W	Poaceae	VC	VC
<b>SHRUBS</b>				
8	<i>Ardisia littoralis</i> Andr.	Sapotaceae	O	A
9	<i>Clerodendron inerme</i> Gaertn.	Verbenaceae	VC	VC
10	<i>Cyperus javanicus</i> Hoult.	Cyperaceae	C	C
11	<i>Phragmites kerka</i> Trin.	Poaceae	O	A
<b>CLIMBING SHRUBS</b>				
12	<i>Caesalpinia crista</i> L.	Caesalpinaceae	O	O
13	<i>Dalbergia candenatensis</i> Prain	Papilionaceae	VR	A
<b>SMALL TREES</b>				
14	<i>Cerbera odollam</i> Gaertn.	Apocyanaceae	C	C
15	<i>Hibiscus tiliaceus</i> L.	Malvaceae	C	C
16	<i>Pandanus fascicularis</i> Lamk.	Pandanaceae	C	C
17	<i>Premna serratifolia</i> L.	Verbenaceae	R	R
18	<i>Quassia indica</i> (Gaertn.) Nooteb	Simaroubaceae	C	C
<b>MEDIUM SIZED TREES</b>				
19	<i>Barringtonia racemosa</i> (L.) Spreng.	Barringtoniaceae	C	C
20	<i>Dolichandrone spathacea</i> Seem.	Bignoniaceae	R	A
<b>LARGE TREES</b>				
21	<i>Calophyllum inophyllum</i> L.	Guttiferae	C	O
22	<i>Heritiera littoralis</i> Dryand	Sterculiaceae	O	A
23	<i>Thespesia populnea</i> (L.) Sol. Ex Correa	Malvaceae	C	C

  

R Rare	VR – Very Rare	VC – Very Common
C – Common	O – Occasional	A – Absent

APPENDIX – III

**Fish fauna – commercially important species and their ecology**

Species	Ecology
<b>A. Fish</b>	
Grey mullets ( <i>Mugil, Liza</i> )	Marine and estuarine: very tolerant to salinity fluctuations: fry enters estuary in post-monsoon months
<i>Mugil cephalus</i>	
<i>M. cunnesius</i>	
<i>M. parsia</i>	
<i>M. macrolepis</i>	
Sciaenids	
(Daysciaena albida)	Marine: lower estuary
Seabass or Cock-up	Marine: very tolerant to low salinities
Milk fish ( <i>Chanos chanos</i> )	Marine: far upstream in estuary
Marine catfish	Spawning in lower estuary: seaward migration of young fish
<i>(Tachysurus spp.)</i>	
Half beaks ( <i>Hyporamphus spp.</i> )	Estuarine: upper and middle estuary
Tarpon ( <i>Megalops cyprinoides</i> )	Estuarine: head and upper estuary
<b>B. Crustaceans</b>	
Penaeid prawns	Marine: post-larval migration into estuary for hatching of larval prawns
Edible crab	
(Scylla serrata)	Estuarine: migration of juvenile crabs towards lower salinities
<b>C. Molluses</b>	
Black clam	Estuarine: tolerant of wide salinity range: maximum growth at higher salinities.
<i>Velorita cyprinoides</i>	
<i>B. cornucopia</i>	
<i>Meretrix meretrix</i>	
<i>Ostrea cuculata</i>	



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**TABLE 5 AVIFAUNA OF KOL  
WETLANDS**

**Podicipedidae**

1. *Podiceps ruficollis capensis* Salvadori  
Pelicanidae

2. *Pelicanus philipensis* Gmelin Phalacrocoracidae

3. *Phalacrocorax carbosinensis* (Shaw)

4. *Phalacrocorax fuscicollis* Stephens

5. *Phalacrocorax niger* (Vieillot)

6. *Anhinga rufa melanogaster* Pennant

**Ardeidae**

7. *Ardea cinerea*

8. *Ardea purpurea*

9. *Ardeola grayii* (Sykes)

10. *Bubulcus ibis coromandus* (Boddeart)

11. *Egretta garzella* (L.)

12. *Egretta sarca* (Gmelin)

13. *Nycticorax nycticorax* (L.)

14. *Ixobrychus cinnamomeus* (Gmelin)

15. *Ixobrychus sinensis* (Gmelin)

16. *Ixobrychus flavicollis* (Latham)

17. *Bulroides striatus*

18. *Vesophox inlermedia*

19. *Casmeroides albus*.

**Ciconiidae**

20. *Anas ocellatus* (Boddeart)

21. *Ciconia episcopus* (Boddeart)

22. *Ciconia ciconia* (L.)

**Threskiornithidae**

23. *Threskiornis melanocephala* (Latham)

24. *Plegadis falcinellus* (L.) Anatidae

25. *Dendrocygna javanica* (Horsfield)

26. *Sarkidiornis melanotos* (Pennant)

27. *Anas crecca* L.

28. *Anas acuta* L.

29. *Anas querquedula* L.

30. *Vellapus coromandelianus* (Gmelin)

**Accipitridae**

31. *Haliastur indus* (Boddaert)

32. *Circus aeruginosus* (L.)

33. *Circus macrourus* (S.G. Gmelin)

34. *Circus melanoleuco* (Pennant)

35. *Pandion haliaetus* (L.)

**Rallidae**

36. *Porzana pusilla* (Pallas)

37. *Amaurornis fuscus zeylonicus* Baker

38. *Gallinula cinerea* (Gmelin)

39. *Gallinula chloropis* Blyth

40. *Porphyrio porphyrio* (L.)

41. *Fulica atra* L.

**Jacaniidae**

42. *Metopidius indicus* (Latpam)

43. *Hydrophasianus chirurgus* (Scopoli)

**Recurvirostridae**

44. *Himantopus himantopus* (L.)

**Glareolidae**

45. *Glareola lactea* Temminck

46. *Glareola pratincole maldivarum* J R Forst

**Charadriidae**

47. *Vanellus indicus* (Boddeart)

48. *Vanellus malabaricus* (Boddeart)

49. *Pluvialis dominica* Gmelin

50. *Charadrius dubius* Gmelin

51. *Charadrius hiaticula*

52. *Charadrius alexandrinus* L.

53. *Charadrius mongolus* Wagler

54. *Charadrius leschenaultii* Lesson

55. *Numenius arquata* (L.)

56. *Tringa totanus eurhinus* (Oberholson)

57. *Tringa stagnatilis* (Bechstein)

58. *Tringa nebularia* (Gunnerus)

59. *Tringa ochropus* L.

60. *Tringa glareola* L.

61. *Tringa hypoleucos* L.

62. *Gallinago stenura* (Bonaparte)

63. *Gallinago gallinago* (L.)

64. *Calidris minutus* (Leisler)

65. *Calidris temminckii* (Leisler)

66. *Calidris testaceus* (Pallas)

**Laridae**

67. *Larus fuscus* L.

68. *Larus brunnicephalus* Jerdon

69. *Larus ridibundus* L.

70. *Chlidonias hybrida indica* (Stephens)

71. *Gelochelidon nilotica* (Gmelin)

72. *Hydroprogne caspia* (Pallas)

73. *Sterna albifrons*

74. *Sterna melano-gaster*

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**TABLE 6 LIST OF BIRDS OBSERVED FROM KOL WETLANDS, NO LISTED IN  
'BIRDS OF KERALA' (Ali, 1969)**

<b>Family</b>	<b>Species Name</b>
Sulidae	<i>Sula dactylatra melanops</i> Heuglin
Ciconiidae	<i>Ciconia ciconia</i> (L.)
Threskiomithidae	<i>Platalea lellcorodia major</i> Timminck & Schiegl
Anatidae	<i>Anas acuta</i> L.
Anatidae	<i>Sarkidiornis melanotos</i> (Pennant)
Anatidae	<i>Fulica atra atra</i> L.
Rallidae	<i>Himantopus himantopus</i> (L.)
Recurvirostridae	<i>Glareolapratincola maldivarum</i> J R Forster
Glareolidae	<i>Pluvialis squatarola</i> (L.)
Charadriidae	<i>Charadrius dubius curonicus</i> Gmelin
Charadriidae	<i>Calidris temminckii</i> (Leisler)
Charadriidae	<i>Calidris alba</i> (Pallas)
Charadriidae	<i>Larus argentatus heuglini</i> Bree
Laridae	<i>Sterna sandvicensis</i> Latham
Laridae	<i>Riparia paludicola chinensis</i> (Grey J E)
Laridae	<i>Sturnus vulgaris</i> (L.)
Hirundinidae	<i>Oenanthe deserti</i> (Temminck)
Strunidae	<i>Phoenicurus ochrosus rufiventris</i> (Vieillot)
Muscicapidae	<i>Monticola citreola werae</i> (Buturlin)
Muscicapidae	<i>Estrilda amandava</i> (L.)
Motacillidae	
Ploceidae	

**Table 4. Avifauna of Vembanad Wetland****Podicipitidae**

1. *Podiceps ruficollis capensis* Salvadori

**Phalacrocoracidae**

2. *Phalacrocorax niger* (Vicillot)
3. *Phalacrocorax fuscicollis* Stephens
4. *Anhinga rufa melanogaster* Pennant

**Ardeidae**

5. *Ardea cinerea rectirostris* Gould
6. *Ardea purpurea malinensis* Meyen
7. *Ardea alba modesta* J E Grey
8. *Ardeola striatuschloriceps* (Bonaparte).
9. *Ardeola grayii grayii*(Sykes)
10. *Bubulcus ibis coromandus* (Boddeart)
11. *Egretta intermedia* (Wagler)
12. *Egretta garzetta* (L.)
13. *Egretta gularis schistacea* (Hemprich & Ehrenberg)
14. *Nycticorax nycticorax nycticora.*"(L.)
15. *Ixobrychus cinnamomeus* (Gmelin)
16. *Ixobrychus sinensis* (Gmelin)
17. *Ixobrychus flavicollis* (Latham)

**Ciconiidae**

18. *Ciconia episcopus* (Boddaert)

**Anatidae**

19. *Dendrocygnajavamca* (Horsfield)
20. *Anas crecca* L.
21. *Anas acuta* L.
22. *Anas querquedula* L.
23. *Nettapus coromandelianus* (Gmelin)
24. *Aythya nyroca* (Guldenstadt)

**Accipitridae**

25. *Milvus migrans govinda* Sykes
26. *Haliastur indus* (Boddaert)
27. *Accipiter badius* (Gmelin)
28. *Circus aeruginosus* (L.)
29. *Pandion haliaetus* (L.)

**Falconidae**

30. *Falco tinnunculus* L.
31. *Falco ere inus .a onensis* Gmelin

**Rallidae**

32. *Amaurornisjzlsus Zeylonicus* Baker
33. *Rallus striatus* L.
34. *Rallina eurizonoides* (Jerdon)
35. *Porzana pusilla* (Pallas)
36. *Amaurornis phoenicurus*(Pennant)

37. *Gallixrex cinerea* (Gmelin)

38. *Gallinula chloropus indica* Blyth

39. *Porphyrioporphyrrio* (L.)

**Jacaniidae**

40. *Metopidius indicus* (Latham)

**Charadriidae**

41. *Vanellusindicus*(Boddaert)
42. *Vanellusmalabaricus*(Boddaert)
43. *PIIIVialis dominicafulva* (Gmelin)
44. *Charadrius dubius curonicus* Gmelin
45. *Numeniusphaeopus* (L.)
46. *Numenius arquata* (L.)
47. *Tringa totanus eurhinus* (Oberholserj)
48. *Tringa stagnatilis* (Bechstein)
49. *Tringa nebularia* (Gunnars)
50. *Tringa ochropus* L.
51. *Tringa glareola* L.
52. *Tringa hypoleucos* (L)
53. *Gallinago stenura* (Bonaparte)

**Laridae**

54. *Larusfuscus* L.
55. *Larus ichtyaetus* Pallas
56. *Larus brunnicephalus* Jerdon
57. *Larus ridibundus* L.
58. *Chlidonias hybrida indica* (Stephens)
59. *Gelochelidon nilotica* (Gmelin)
60. *Hydroprogne caspia* (Pallas)
61. *Sterna albifrons*
62. *Sterna bergii velox* Cretzschmar
63. *Sterna bengalensis* Lesson

**Columbidae**

64. *Columba livia intermedia* Strickland
65. *StreDtoDelia chinensis* (Gmelin)

**Psittacidae**

66. *Psittacula krameri mamllensis* (Bechstein)
67. *Psittacula cyanocephala* (L. )
68. *Loriculus vernalis* (Spamnan)

**Cuculidae**

69. *Cuculus varius* Vahl
70. *Cuculus micropterus* Gould
71. *Eudynamys scolopacea* (L.)
72. *Centropus sinensis parroti* Stresemann Strigidae
73. *Tyto alba stertens* Hartert
74. *Otus bakkamoena* Pennant
75. *Bubo zeylonensis* (Temminck)

76. *Ninox scutulata hirsuta* Temminck)

77. *Athene brama rrenuninck*)

78. *Strix ocellata* (Lesson)

#### **Apodidae**

79. *Apus melba nubifuga* Koetz

80. *Apus affims* Grey J E

81. *Cypsiurusparvus balasinensis* Grey J E

#### **Alcedinidae**

82. *Ceryle rudis travancorensis* Whistler

83. *Alcedo atthis* Kleinschmidt

84. *Pelargopsis capensis* L.

85. *Halcyon smyrnensis* (Boddaert)

#### **Meropidae**

86. *Merops philippinus* L.

87. *Meropus orientalis* (Latham)

#### **Coraciidae**

88. *Coracias benghalensis indica* Latham

#### **Capitonidae**

89. *Megalaima viridis* (Boddaert)

90. *Megalaima haemacephala indica* Latham

#### **Picidae**

91. *Dinopium benghalense* (Whistler&Kinnear)

92. *Ereopterix grisea*

#### **Alaudidae**

93. *Galerida malabarica* Sepoli

94. *Alauda gulgzda australis* Brooks

#### **Pittidae**

95. *Pitta brachyura* (L.)

#### **Hirundinidae**

96. *Hinlndo nlstica gzlttularis* Sepoli

97. *Hinlndo daurica erythrogygia* Sykes

#### **Laniidae**

98. *Lamus cristatus* L

#### **Oriolidae**

99. *Oriolus oriolus* Sykes

100. *Oriolus xanthornus* Franklin

#### **Dicruridae**

101. *Dicrurus adsimilis* Viellot

102. *Dicrurus leucophaeus* Hay

103. *Dicrurus aeneus* Viellot

104. *Dicrurusparadiseus* (L.)

#### **Artamidae**

105. *Artamusfuscus* Viellot

#### **Sturnidae**

106. *Acridotheres Iritis* (L.)

107. *Acridotheres fuscus mahratensis* (Sykes )

#### **Corvidae**

108. *Dendriocitta vagabunda* Whistler

109. *Corvus splendensprotegatus* Madarasz

110. *Corvus macrorhynchos culminatus* Sykes.

#### **Cam pephagidae**

111. *Tephrodornis pondicerianus* (Gmelin)

112. *Coracina novaehollandiae macei* (Lesson)

113. *Coracina melanoptera* ( Strickland)

114. *Pericrocotus cinnamomeus malabariells* (Gmelin)

#### **Irenidae**

115. *Aegithina tiphia multicolor* (Gmelin)

116. *Chloropsis cochinchinensis* (Blyth)

#### **Pycnonotidae**

117. *Pycnonotus jocosus fuscicaudatus* (Gould)

118. *Pycnonotus cater* (L.)

119. *Trdoides affinis affinis* (Jerdon)

120. *Cisticola juncidi*

#### **Muscicapidae**

121. *Rhipidura aureola* (Blith)

122. *Muscicapa latirostris* Raffies

123. *Terpsiphoneparadisi leucogasrer* (Swainson)

124. *Prinia hodgsonni albogztlaris* (Walden)

125. *Prinia subflava franklinii* Blyth

126. *Prinia socialis* Sykes

127. *Orthotomus sutorius guzuratus* (Latham)

128. *Acrocephalus stenroreus brunnescens* (Jerdon)

129. *AcroceDhalus dumetornm* Blyth

130. *Erithacus svecicus* (L.)

131. *Copsychus saularis ceylonensis* Sclater

132. *Saxicoloidesfulicata* (L.)

#### **Motacillidae**

133. *Anthus similis travancorensis* Ripley

134. *Motacillaflava thunbergi* Billberg

135. *Motacilla citreola werae* (Buturlin)

136. *Motacilla cinerea* Tunstall

137. *Motacilla alba duckhunensis* Sykes.

138. *Motacilla indica* Gmelin

139. *Motacilla maderaspatensis* Gmelin

#### **Dicaeidae**

140. *Dicaeum erythrorhyncos* Latham

#### **Nectariniidae**

141. *Nectarinia zeylonica flaviventris* (Hennann)

142. *Nectarinia asiatica* (Latham)

143. *Nectarinia lotenia hindustanica* (Whistler)

**Ploceidae**

- 144. *Petronia zanthocollis* (Burton)
- 145. *Ploceus philippinus trm'ancorensis* Whistler
- 146. *Ploceus manyar javiceps* Lesson
- 147. *Lonchura striata* (L.)
- 148. *Lonchurapunctulata* (L.)
- 149. *Lonchura malacca* (L.)