Meinmahla Kyun Wildlife Sanctuary

Myanmar

EAAF NETWORK SITE CODE FOR OFFICE USE ONLY:

E	A	A	F	1	4	0

Site Information Sheet on East Asian-Australasian Flyway Network Sites (SIS) – 2017 version

Available for download from http://www.eaaflyway.net/about/the-flyway/flyway-site-network/

Categories approved by Second Meeting of the Partners of the East Asian-Australasian Flyway Partnership in Beijing, China 13-14 November 2007 - Report (Minutes) Agenda Item 3.13

Notes for compilers:

1. The management body intending to nominate a site for inclusion in the East Asian - Australasian Flyway Site Network is requested to complete a Site Information Sheet. The Site Information Sheet will provide the basic information of the site and detail how the site meets the criteria for inclusion in the Flyway Site Network. When there is a new nomination or an SIS update, the following sections with an asterisk (*), from Questions 1-14 and Question 30, must be filled or updated at least so that it can justify the international importance of the habitat for migratory waterbirds.

2. The Site Information Sheet is based on the Ramsar Information Sheet. If the site proposed for the Flyway Site Network is an existing Ramsar site then the documentation process can be simplified.

3. Once completed, the Site Information Sheet (and accompanying map(s)) should be submitted to the Secretariat. Compilers should provide an electronic (MS Word) copy of the Information Sheet and, where possible, digital versions (e.g. shapefile) of all maps.

1. Name and contact details of the compiler of this form *:

Compiler 1

Full name:

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2. Date this sheet was completed *:

DD/MM/YYYY

23/06/2018

3. Country *:

Republic of the Union of Myanmar

4. Name of the Flyway Network site *:

Accepted English transcription of the Site's name.

Meinmahla Kyun Wildlife Sanctuary

5. Map of site *:

The most up-to-date available and suitable map of the wetland should also be appended to the SIS (only in digital format and shape file). The map must clearly show the boundary of the site. Please refer to the "Digitising Site Boundaries in Google Earth" file linked here.

6. Geographical coordinates (latitude/longitude, in decimal degrees) *:

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

The Ramsar site corresponds to the southern section of the Bogalay River in the Ayeyarwady Delta in Myanmar, within which the main feature is Meinmahla Island. One island, Law Ka Dat Kyun, is situated in the east of Meinmahla Kyun and is included in the wildlife sanctuary. The total wildlife sanctuary area is
13619.35 ha. The boundary is the same as the designated Ramsar site and is defined in the north by the border of the Meinmahla Kyun Wildlife Sanctuary, to the east and west by the banks of the Bogalay river at high tide, and in the south by the Gadongalay island chain (west to east; Hgnet Oo Thaung, Ma Sein, Gadongalay, Gayetgyi and Nga Mann islands), covering a total area of approx. 50,000 ha. GPS location of Centre-point is **15°52'45.21"N, 95°15'35.56"E.**

7. Elevation *: (in metres: average and/or maximum & minimum)

Average 1 Meter

8. Area *:

The total area of the site, in hectares. If the areas of discrete site units are known, please also list each of these together with the names (or labels) used to identify and differentiate these units.

Estimate 430000 hectares (including water surface area)

9. General overview of the site *:

A brief (two sentences) summary of the site, mentioning principal physical and ecological functions, and its importance for migratory waterbirds.

Meinmahla Kyun Wildlife Sanctuary and islands situated at the river mouth of Bogalay River has mangrove forests and mudflats those are important habitats for various resident and migratory water birds and waders such as critically endangered Spoon-billed Sandpiper and endangered Nordmann's Greenshank.

10. Justification of Flyway Site Network criteria *:

Please provide waterbird count information (with year of latest count) that demonstrates that the site meets the criteria of the Flyway Site Network (Annex 1). That is:

- it regularly supports > 20 000 migratory waterbirds; or,
- it regularly supports > 1 % of the individuals in a population of one species or subspecies of migratory waterbird; or,
- it supports appreciable numbers of an endangered or vulnerable population of migratory waterbird
- it is a "staging site" supporting > 5 000 waterbirds, or > 0.25% of a population stage at the site.

A listing of the populations of migratory waterbirds covered by the East Asian – Australasian Flyway Partnership and the 1% thresholds is attached (Annex 3).

The "staging site" criterion is particularly difficult to apply and application of this should be discussed with the Secretariat. Also note that some species have several populations that are very difficult to distinguish in the field.

The area supports five globally threatened species, Spoon-billed Sandpiper (CR): 2 birds

Nordmann's Greenshank (EN): 26 birds
Great Knot (EN): 140 birds, Vulnerable Lesser Adjutant Storks (VU)

The eastern part of Gayet Kyi: Nga Man Thaung Island situated at the river mouth of Bogalay River is the most important part for over 3000 migratory water birds, mostly shorebirds, gulls and that use the mudflats and the remote part of the islands as wintering areas. Globally threatened species such as critically endangered **Spoon-billed Sandpiper**, which was observed twice on 28th November [150

41.562'N 950 21.330'E], but observations probably referred to just one individual. On 27th November at High Tide, a roost of a total of 48 of the globally endangered **Nordmann's Greenshank** was counted [150 41.417'N 950 21.026' E]. This is more than **2%** of the global population and reflects the high importance of the outer islands for this species. The presence of these Globally Threatened species means that the area reaches Ramsar status. **Over 140 of the Endangered Great Knot were also observed. The Near Threatened Eurasian Curlew (120 birds), Black-tailed Godwit (16 birds) and Black-headed Ibis (120 birds) also use the area.**

At the southernmost tip of the Meinmahla Kyun, 5 of the Vulnerable Lesser Adjutant Storks (Vulnerable under the Red List) were observed, and two more were recorded a little further south on the eastern shore of the island, highlighting the status of the mangrove forest as well as the intertidal mudflats as feeding areas for this Globally Threatened stork species. (Saw Moses & Christoph Zockler, 2013, FFI report to Forest Department) 2 Critically Endangered Spoon- billed Sand pipers were recorded in 2014 February on Nga Man Thaung by FFI and Wildlife bird survey.

Count estimates indicate that 5 species of waterbirds are present in the non-breeding season in sufficient numbers to represent more than 1% of the relevant biogeographic population in each case. Surveys have been undertaken on several occasions from 2010 to 2015, but methods have varied and they do not allow a simple averaging of numbers, so totals in many cases are expressed as estimates. In the table below, the population percentages in these cases are for the time being therefore also shown as ranges.

Species	Biogeographic Population	Estimated total at MKWS and Eastern Delta Islands	1% threshold (WPE5)	%* supported at the site
Black-headed Ibis *Threskiornis melanocephalus*	SE Asia	120	100	1.2%
Lesser Sand Plover** *Charadrius mongolus*	Includes monogolus, atrifrons and stegmanji populations	3,500	1,900**	1.8%
Greater Sand Plover *Charadrius leschenaultii*	Leschenaultia, SE Asia, Australia	1,500	790	2.1%
Notdamann's Greenshank *Tringa guttifer*	SE Asia	48	10	4.8%

Brown-headed Gull *Larus brunnicephalus*	East Asia (breeding)	2,800	1,000	2.8%

11. Wetland Types *:

List the wetland types present (see Annex 2). List the wetland types in order of their area in the Flyway Network site, starting with the wetland type with the largest area.

F, G, I
Marin or coastal wetlands

Wetland types (code and name)[1]	Local name	Ranking of extent (1:greatest - 4:least)	Area (ha) of wetland type	Justification of Criterion 1[2]
I = Intertidal forested wetlands	Meinmahla Kyun Di Yay Taw	1		Representative
F = Estuarine waters	Meinmahla Kyun Yay Cho Yay Ngan Sat Day Tha	2		
G = Intertidal mud, sand flats	Gadongalay and Nga Mang Thaung	1		
G = Intertidal mud, sand or salt flats.	Meinmahla Kyun Thaung Pyin	4		

[1] A: Permanent shallow marine waters | B: Marine subtidal aquatic beds (Underwater vegetation) | C: Coral reefs | D: Rocky marine shores | E: Sand, shingle or pebble shores | G: Intertidal mud, sand or salt flats | Ga: Bivalve (shell-fish) reefs | H: Intertidal marshes | I: Intertidal forested wetlands | J: Coastal brackish / saline lagoons | F: Estuarine waters | Zk(a): Karst and other subterranean hydrological systems | K: Coastal freshwater lagoons

[2] | Representative | Rare | Unique

12. Jurisdiction *:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Ministry of Agriculture/Dept. of Environment, etc.

Ministry of Environmental Conservation and Forestry, Ayeyarwady Region, Pyarpon District, Bogalay Township.

13. Management authority *:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland and the title and/or name and email address/phone number of the person or persons in this office with direct responsibility for managing the wetland.

Park Warden, Meinmahlakyun wildlife sanctuary, Nature and Wildlife Conservation Division, Forest Department, Ministry of Natural Resources and Environmental Conservation.

14. Bibliographical references *:

A list of key technical references relevant to the wetland, including management plans, major scientific reports, and bibliographies, if such exist. Please list Web site addresses dedicated to the site or which prominently feature the site, and include the date that the Web site was most recently updated. When a large body of published material is available about the site, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies.

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MBNS [Myanmar Bird and Nature Society] (2006). Field Feathers 2006-1. MBNS, Yangon

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Moses, S. & C. Zöckler (2013). Bird Survey of the Ayeyarwaddy Delta Region in 2013. Unpublished Rep for Fauna and Flora International. Yangon

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Ohn U (1992). Multiple use potential of mangrove in the Ayeyarwady delta. Workshop on conservation and rehabilitation of mangrove resources in Myanmar, UNDP/FAO.

Ono, J. et al. (2016). Bruguiera hainesii, a critically endangered mangrove species, is a hybrid between B. cylindrica and B. gymnorhiza (Rhizophoraceae). Conservation Genetics 18: 00-00.

Oo, N.W. (2002). Present state and problems of mangrove management in Myanmar. Trees 16: 218-223

Polidoro, B.A. et al (2010). The loss of species: mangrove extinction risk and geographic areas of concern. PLoS One 5, e10095, http://dx.doi.org/10.1371/journal.pone.0010095.

Saw Han U (1992). Comparative study on Ayeyarwady and Rakhine mangroves. Workshop on conservation and rehabilitation of mangrove resources in Myanmar, UNDP/FAO.

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Scott, D.A. (ed.) (1989). A Directory of Asian Wetlands. IUCN. Gland, Switzerland and Cambridge, U.K. 1181 p.

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15. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Surface area: 51121 Hectares (including water body)

Surface area: 13669 Hectares (only Meinmahla Kyun island) General geology: River mouth alluvial plain
Geomorphology: Flat plain

General soil type: Sticky mud on the Meinmahla Kyun island, salty and sandy loam in the outer parts of the island, sandy flats in the southern part of the island; Gadonlay, Gayetkyi and Nga Man Thaung are dominated by salty sand and sandy beach.
Climate: Monsoon climate; heavy rain in the rainy season start from June to October and the rest months of the year are very dried.

16. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

General geology: River mouth alluvial plain
Geomorphology: Flat plain
General soil type: Sticky mud, muddy loam, sandy loam
Climate: Monsoon climate; heavy rain in the rainy season start from June to October and the rest months of the year are very dried.

17. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

N/A.

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Flyway Network site, and the ecosystem services of the site and the benefits derived from them.

The Main habitat type are mangrove forest in Meinmahla Kyun island and sandy beach in the nearby islands. The eastern part of Gayet Kyi: Nga Man Thaung Island situated at the river mouth of Bogalay is the most important over 3000 migratory water birds, mostly shorebirds, gulls and that use the mudflats and the wintering areas. Globally threatened species such as critically endangered Spoon-billed Sandpiper, 48 of the globally endangered, Over 140 of the Vulnerable Great Knot were also observed. Additional Nearly Threatened species included 120 Eurasian Curlews, 16 Black-tailed Godwits and 120 Black-headed Ibises. At the southern part of Meinmahla Kyun, 3 Vulnerable Lesser Adjutant Storks, the mangrove forest as well as the intertidal mudflats as feeding areas for Globally Threatened stork species,

and Critically Endangered Spoon-billed Sandpipers (2) were recorded in 2014 February on Nga Man Thaung.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

Meinmahlakyun Wildlife Sanctuary is Mangrove forest and sandy beach in the nearby islands. They are dominated by genera typical of Southeast Asia such as *Rhizophora* and *Sonneratia* spp.,

List of Dominant Plant Species in MeinmahlaKyun Wildlife Sanctuary

Scientific name	Common name	Position in range/ endemism/ other
Acanthus ilicifolius	Kha Yar Mayan	LC
Acanthus ebracteatus	Kha Yar Phyu	LC
Acanthus volubilis	Kha Yar Nwe	LC
Acrostichum aureum	Ngahk Kyi taung Yauk Gyi	LC
Aegiceras corniculatum	Yae kha Yar	LC
Aglaia cucullate	Pant Tha Ka	DD
Avicennia alba	Thamaek Kya tak	LC
Avicennia officinalis	Thamaek Gyi	LC
Brownlowia tersa	Yae Tha Man	LC
Bruguiera gymnorhiza	Byu Oak Saung	LC
Bruguiera sexangula	Byu shwe War	LC
Ceriops decandra	Madama	NT
Cynometra iripa	Myin Ka	LC
Dolichandrone spathacea	Yae Tha Chauk	LC
Excoecaria agallocha	Tha Yaw	LC
Kandelia candel	Byu Baing Tauk	LC
Lumnitzera racemosa	Ah Ma Thwe	LC
Nypa fruticans	Don	LC
Phoenix paludosa	Thin Baung	NT
Rhizophora apiculata	Byu Chae Thauk (M)	LC
Rhizophora murconata	Byu Chae Thauk (F)	LC
Scyphiphora hydrophyllacea	Pin lae Pon Yeik	LC
Sonneratia apetala	-	LC
Sonneratia caseolaris	La Mu	LC
Xylocarpus granatum	Pin Lae Ohn	LC

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 10. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

Estaurine Crocodiles(LC) , Ayarwaddy Dolphin(VU) , Common Otter (NT) recorded in Meinmahlakyun Wildlife Sanctuary (Appendix -1,2)

21. Social, economic and cultural values:

a) Describe if the site has any general social, economic and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Cultural value: The island is very important religious site for the Myanmar fishing communities. Shrine of U Shin Gyi, important spirit for the fishing communities is located on the island.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? (Double-click the checkbox to check and choose "Checked" under "Default Value" from "Check Box Form Field Options" window)

If yes, tick the box ❑ and describe this importance under one or more of the following categories:

I. Sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland: ☐

II. Sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland: ☒

(U Shhina Gyi nat shrine)

III. Sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples: ☒

(Local communities depend on natural resources from the wildlife sanctuary)

IV. Sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland: ☒

(Fisher communities believe on U Shin Gyi for the fisheries livelihood)

22. Land tenure/ownership:

a) Within the Flyway Network site:

Meinmahla Kyun Wildlife Sanctuary managed the Nature and Wildlife Conservation Division, Forest Department. The islands owned by Department of Fisheries and Administrative Department.

b) In the surrounding area:

Reserved Forest managed by Forest Department.

23. Current land (including water) use:

a) Within the Flyway Network site:

There are two relevant authorities are Meinmahla Kyun wildlife sanctuary and Fishery Department.

b) In the surroundings/catchment:

The surrounding areas are situated in the Reserved Forest areas and managed by the Forest Department.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) Within the Flyway Network site:

N/A

b) In the surrounding area:

N/A

25. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Flyway Network site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

Ramsar site, ASEAN Heritage Park

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate, see Annex 3):

Ia ☐; Ib ☐; II ☒; III ☐; IV ☐; V ☐; VI ☐; N/A ☐

c) Does an officially approved management plan exist; and is it being implemented?:

No

If yes, is it being implemented?: If no, is one being planned?

Nature and Wildlife Conservation Division, Forest Department is preparing management plan in collaboration with Fauna and Flora International (FFI) to conserve the area in collaboration with government , departments and local communities

d) Describe any other current management practices:

Nature and Wildlife Conservation Division is managing this area according to Park Management Biodiversity and Protected Area laws and regulations

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

Management plan have been finished in 2017 with Floral , Fauna International

27. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Crocodile survey , Annual bird survey and fish survey with local university , WCS and FFI. Patrol and guarding activities , to prevent hunting activities

28. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Visitor's centre, observation buildings, information booklets in Myanmar language, and CEPA activities in surrounding village.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Tourism development from 2015 , (300 foreigners and 30000 local visitors per year)

30. Threats *:

Which of the following threats is present historically – when the threat stopped but the effects are still there (H), currently (C) or potentially (P)?

	Historically	Currently	Potentially
Residential and commercial development			
housing and urban areas	☐	☐	☐
commercial and industrial areas	☐	☐	☐
tourism and recreation areas	☐	☒	☒
Agriculture and aquaculture			
annual and perennial non-timber crops	☐	☐	☐
wood and pulp plantations	☐	☐	☐
livestock farming and ranching	☐	☐	☐
marine and freshwater aquaculture	☐	☐	☐
Energy production and mining			
oil and gas drilling	☐	☐	☐
mining and quarrying	☐	☐	☐
renewable energy	☐	☐	☐
Transportation and service corridors			
roads and railroads	☐	☐	☐
utility and service lines	☐	☐	☐
shipping lanes	☐	☐	☐
flight paths	☐	☐	☐
Biological resource use			
hunting and collecting terrestrial animals	☒	☒	☐

gathering terrestrial plants	☒	☒	☐
logging and wood harvesting	☒	☒	☐
fishing and harvesting aquatic resources	☒	☒	☒
Human intrusions and disturbance			
recreational activities	☐	☐	☐
war, civil unrest and military exercises	☐	☐	☐
work and other activities	☒	☒	☐
Natural system modifications			
fire and fire suppression	☐	☐	☐
dams and water management/use	☐	☐	☐
other ecosystem modifications	☐	☐	☐
Invasive and other problematic species and genes			
invasive non-native/alien species	☐	☐	☐
problematic native species	☐	☐	☐
introduced genetic material	☐	☐	☐
Pollution			
household sewage and urban waste water	☐	☐	☐
industrial and military effluents	☐	☐	☐
agricultural and forestry effluents	☐	☐	☐
garbage and solid waste	☐	☐	☐
air-borne pollutants	☐	☐	☐
excess energy	☐	☐	☐
Geological events			
volcanoes	☐	☐	☐
earthquakes/tsunamis	☐	☐	☐
avalanches/landslides	☐	☐	☐
Climate change and severe weather			
habitat shifting and alteration	☐	☐	☐
droughts	☐	☐	☐

temperature extremes	☐	☐	☐
storms and flooding	☒	☒	☒

Please write here any additional threats and comments/queries you have on the threats.

N/A

Annex 1: Criteria for the inclusion of sites in the Flyway Site Network

(From the Partnership Text)

To be considered for inclusion in the Flyway Site Network, this Partnership adopts the following criteria:

a. Convention on Wetlands (Ramsar, Iran, 1971) criteria for internationally important sites for migratory waterbirds. That is:

   Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

   Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

   Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

b. The staging criteria as applied under the Asia - Pacific Migratory Waterbird Conservation Strategy. That is:

   i. A staging site should be considered internationally important if it regularly supports 0.25% of individuals in a population of one species or subspecies of waterbirds on migration.

   ii. A staging site should be considered internationally important if it regularly supports 5,000 or more waterbirds at one time during migration.

c. Under exceptional circumstances a site can be nominated if it supports migratory waterbirds at a level or stage of their life cycle important to the maintenance of flyway populations. Justification of such nominations will be considered by the Partnership on a case by case basis.

Annex 2: Ramsar Classification System for Wetland Type

The codes are based upon the Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of the Contracting Parties. The categories listed herein are intended to provide only a very broad framework to aid rapid identification of the main wetland habitats represented at each site.

To assist in identification of the correct Wetland Types to list in section 19 of the RIS, the Secretariat has provided below tabulations for Marine/Coastal Wetlands and Inland Wetlands of some of the characteristics of each Wetland Type.

Marine/Coastal Wetlands

A -- **Permanent shallow marine waters** in most cases less than six metres deep at low tide; includes sea bays and straits.

B -- **Marine subtidal aquatic beds**; includes kelp beds, sea-grass beds, tropical marine meadows.

C -- **Coral reefs**.

D -- **Rocky marine shores**; includes rocky offshore islands, sea cliffs.

E -- **Sand, shingle or pebble shores**; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.

F -- **Estuarine waters**; permanent water of estuaries and estuarine systems of deltas.

G -- **Intertidal mud, sand or salt flats**.

H -- **Intertidal marshes**; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.

I -- **Intertidal forested wetlands**; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.

J -- **Coastal brackish/saline lagoons**; brackish to saline lagoons with at least one relatively narrow connection to the sea.

K -- **Coastal freshwater lagoons**; includes freshwater delta lagoons.

Zk(a) – **Karst and other subterranean hydrological systems**, marine/coastal

Inland Wetlands

L -- **Permanent inland deltas**.

M -- **Permanent rivers/streams/creeks**; includes waterfalls.

N -- **Seasonal/intermittent/irregular rivers/streams/creeks**.

O -- **Permanent freshwater lakes** (over 8 ha); includes large oxbow lakes.

P -- **Seasonal/intermittent freshwater lakes** (over 8 ha); includes floodplain lakes.

Q -- **Permanent saline/brackish/alkaline lakes**.

R -- **Seasonal/intermittent saline/brackish/alkaline lakes and flats**.

Sp -- **Permanent saline/brackish/alkaline marshes/pools**.

Ss -- **Seasonal/intermittent saline/brackish/alkaline marshes/pools**.

Tp -- **Permanent freshwater marshes/pools**; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

Ts -- **Seasonal/intermittent freshwater marshes/pools on inorganic soils**; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.

U -- **Non-forested peatlands**; includes shrub or open bogs, swamps, fens.

Va -- **Alpine wetlands**; includes alpine meadows, temporary waters from snowmelt.

Vt -- **Tundra wetlands**; includes tundra pools, temporary waters from snowmelt.

W -- **Shrub-dominated wetlands**; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.

Xf -- **Freshwater, tree-dominated wetlands**; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.

Xp -- **Forested peatlands**; peatswamp forests.

Y -- **Freshwater springs; oases**.

Zg -- **Geothermal wetlands**

Zk(b) – **Karst and other subterranean hydrological systems**, inland

Note: "**floodplain**" is a broad term used to refer to one or more wetland types, which may include examples from the R, Ss, Ts, W, Xf, Xp, or other wetland types. Some examples of floodplain wetlands are seasonally inundated grassland (including natural wet meadows), shrublands, woodlands and forests. Floodplain wetlands are not listed as a specific wetland type herein.

Human-made wetlands

1 -- **Aquaculture** (e.g., fish/shrimp) **ponds**

2 -- **Ponds**; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).

3 -- **Irrigated land**; includes irrigation channels and rice fields.

4 -- **Seasonally flooded agricultural land** (including intensively managed or grazed wet meadow or pasture).

5 -- **Salt exploitation sites**; salt pans, salines, etc.

6 -- **Water storage areas**; reservoirs/barrages/dams/impoundments (generally over 8 ha).

7 -- **Excavations**; gravel/brick/clay pits; borrow pits, mining pools.

8 -- **Wastewater treatment areas**; sewage farms, settling ponds, oxidation basins, etc.

9 -- **Canals and drainage channels, ditches.**

Zk(c) -- **Karst and other subterranean hydrological systems**, human-made

Annex 3: IUCN Protected Areas Categories System

IUCN protected area management categories classify protected areas according to their management objectives. The categories are recognized by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation.

Ia Strict Nature Reserve
Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.

Ib Wilderness Area
Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

II National Park
Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

III Natural Monument or Feature
Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

IV Habitat/Species Management Area
Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

V Protected Landscape/ Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct charcter with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected area with sustainable use of natural resources

Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems.

Appendix -2 : List of waterbirds in Meinmahlakyun Wildlife Sanctuary

Phylum	Scientific name	Common name	Pop. Size(optional)	Period of pop. Est. (optional)
Chordata	*Dendrocygna Javanica*	Lesser Whistling-Duck		2015
Chordata	*Leptoptilos Javanicus*	Lesser Adjutant		2015
Chordata	*Threskiornis melanocephalus*	Black-headed Ibis	75	2015
Chordata	*Nycticorax*	Black-crowned Night-Heron	50+	2015
Chordata	*Butorides striata*	Little Heron	50+	2015
Chordata	*Ardeola grayii*	Indian Pond-Heron		2015
Chordata	*Ardeola bacchus*	Chinese Pond Heron		2015
Chordata	*Bubulcus coromandus*	Eastern Cattle Egret		2015
Chordata	*Ardea cinerea*	Grey Heron	20	2015
Chordata	*Ardea purpurea*	Purple Heron		2015
Chordata	*Ardea alba*	Great Egret	100+	2015
Chordata	*Mesophoyx intermedia*	Intermediate Egret	100+	2015
Chordata	*Egretta garzetta*	Little Egret	200+	2015
Chordata	*Phalacrorax niger*	Little Cormorant		2015
Chordata	*Spilornis cheela*	Crested Serpent Eagle	2	2015
Chordata	*Falco tinnunculus*	Common Kestrel		2015
Chordata	*Falco peregrinus*	Peregrine Falcon		2015
Chordata	*Pandion haliaetus*	Osprey		2015
Chordata	*Pernis ptilorhynchus*	Oriental Honeybuzzard		2015
Chordata	*Milvus migrans*	Black Kite		2015
Chordata	*Haliastur indus*	Brahminy Kite		2015
Chordata	*Accipiter virgatus*	Besra		2015
Chordata	*Aviceda leuphotes*	Black Baza		2015
Chordata	*Aquila pennata*	Booted Eagle	2	2016
Chordata	*Amaurornis phoenicurus*	White-breasted Waterhen		2015
Chordata	*Porzana fusca*	Ruddy-breasted Crake	10+	2016
Chordata	*Gallirallus striatus*	Slaty-breasted Crake		2015
Chordata	*Pluvialis fulva*	Pacific Golden Plover	20	2016
Chordata	*Pluvialis squatarola*	Grey Plover	120	2016

Chordata	*Charadrius alexandrinus*	Kentish Plover	1000	2016
Chordata	*Charadrius mongolus*	Lesser Sand-Plover	2000	2016
Chordata	*Charadrius leschenaultii*	Greater Sand-Plover	150	2016
Chordata	*Limosa lapponica*	Bar-tailed Godwit	36	2016
Chordata	*Numenius phaeopus*	Whimbrel	120	2016
Chordata	*Limnodromus semipalmatus*	Asian Dowitcher	2	2015
Chordata	*Numenius arquata*	Eurasian Curlew	105	2015
Chordata	*Xenus cinereus*	Terek Sandpiper	30	2016
Chordata	*Actitis hypoleucos*	Common Sandpiper	50+	2015
Chordata	*Tringa glareola*	Wood Sandpiper	2	2015
Chordata	*Tringa nebularia*	Common Greenshank	20	2016
Chordata	*Tringa guttifer*	Nordmann's Greenshank	48	2015
Chordata	*Tringa stagnatilis*	Marsh Sandpiper	2	2015
Chordata	*Tringa totanus*	Common Redshank	240	2015
Chordata	*Calidris tenuirostris*	Great Knot	260	2016
Chordata	*Calidris canutus*	Red Knot	5	2016
Chordata	*Calidris alba*	Sanderling	10	2015
Chordata	*Calidris ruficollis*	Red-necked Stint	200	2015
Chordata	*Calidris subminuta*	Long-toed Stint	2	2015
Chordata	*Calidris ferruginea*	Curlew Sandpiper	250	2016
Chordata	*Calidris pygmaea*	Spoon - billed Sandpiper	2	2015
Chordata	*Limicola falcinellus*	Broad-billed Sandpiper	350	2015
Chordata	*Arenaria interpres*	Ruddy Turnstone	20	2015
Chordata	*Sternula albifroms*	Little Tern	660	2015
Chordata	*Hydroprogne caspia*	Caspian Tern	360	2015
Chordata	*Sterna bergii*	Greater Crested Tern		2015
Chordata	*Chlidonias hybrida*	Whiskered Tern	10	2016
Chordata	*Larus heuglini*	Heuglin's Gull	5	2015
Chordata	*Larus ichthyaetus*	Pallas's Gull	900	2015
Chordata	*Chroicocephalus brunnicephalus*	Brown-headed Gull	2000	2015