Aphaedo Tidal Flat

Republic of Korea

EAAF NETWORK SITE CODE FOR OFFICE USE ONLY:

E	A	A	F	1	4	6

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

Available for download from https://eaaflyway.net/about-us/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

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2. Date this sheet was completed *:

DD/MM/YYYY

14/10/2019

3. Country *:

Republic of Korea

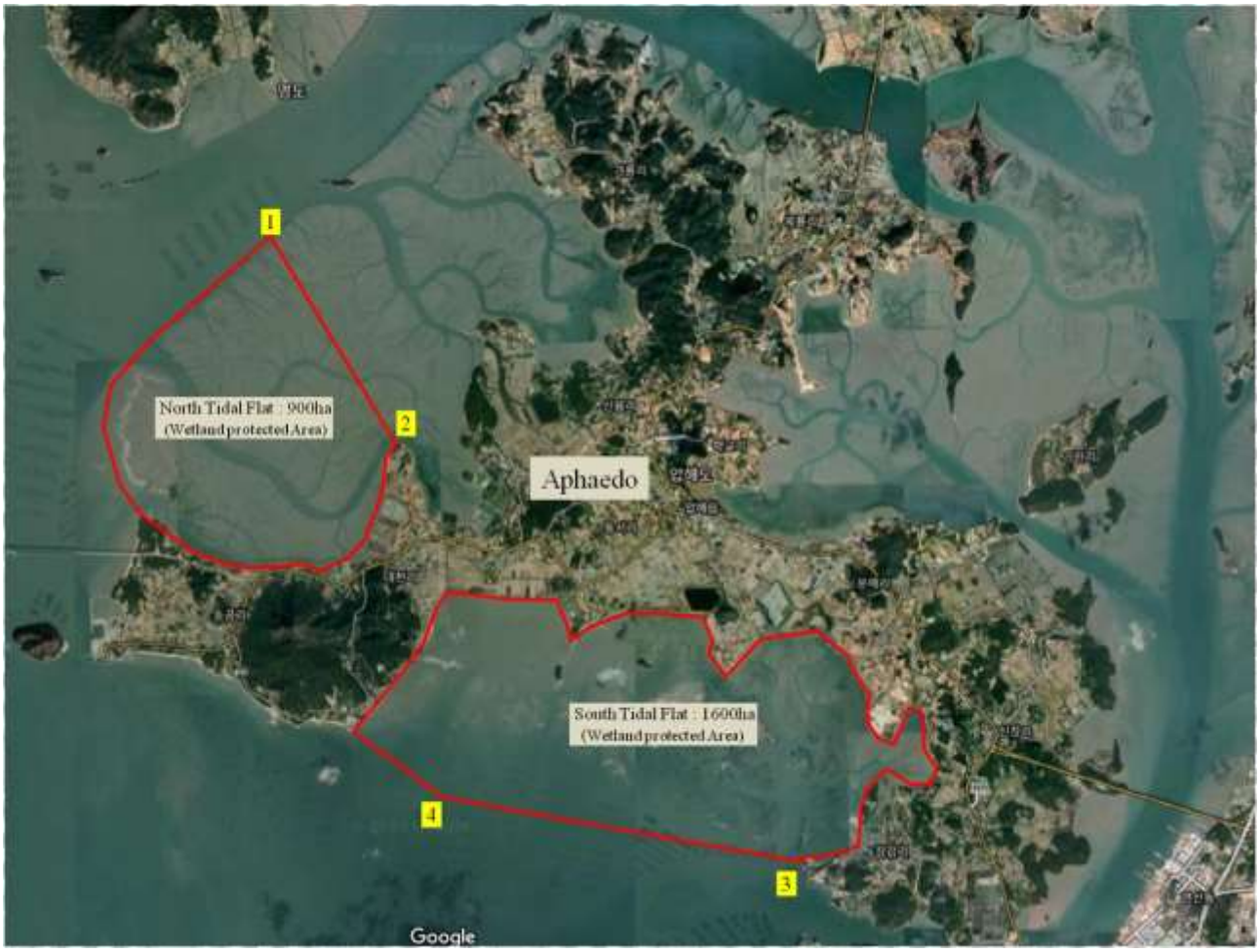
4. Name of the Flyway Network site *:

Accepted English transcription of the Site's name.

Aphaedo Tidal Flat

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.



1. 34° 53′ 46.3″ N, 126° 14′ 57.4″ S
2. 34° 52′ 22.1″ N, 126° 16′ 11.7″ N
3. 34° 49′ 19.3″ N, 126° 19′ 38.7″ N
4. 34° 49′ 24.4″ N, 126° 16′ 21.3″ N

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.

North Tidal Flat (34° 52′ 27″ N, 126° 14′ 41.2″ E), South Tidal Flat (34° 50′ 27.2″ N, 126° 18′ 1.7″ S)

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

Average 2.3m (maximum 4.7m, minimum 0.1m)

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.

2500ha (north tidal flat 900ha, south tidal flat 1600ha)

<Explanation on the proposed Area>
The tidal flat of Aphaedo Island is about 6000ha in total, separated into three parts: north (2500ha), south (1600ha), and east (1900ha). Among them 2500ha, combined with a part of north and whole of south tidal flats, was designated as wetland protected area in 2018. It is also in the process of designation of UNESCO World Heritage as a part of Korean Tidal Flat. Once there was a construction plan of shipyards in the part of north and east tidal flats but it was abandoned. However due to this some local residents desire to develop their area and the tidal flats were excluded in the designation of wetland protected area and proposed World Heritage area.

The high tide of Aphaedo exceeds 500mm during the migratory seasons. However, the east tidal flat is mostly submerged at the tidal height of 300mm. North is 380mm and South is 400mm, respectively. When tide comes, shorebirds congregate on the several retarded un-watered tidal flats and finally they move to roosting places. Last two years of survey on the roosting sites of Aphaedo, we found that most shorebirds feeding and roosting at the tidal flat of Aphaedo and there is a relationship between the retarded un-watered tidal flats and roosting site choice. Our suggested area includes most of the retarded un-watered tidal flats and rooting sites. Also, it supports more than 90% of Chinese Egrets and Eurasian Oystercatchers.

Thus in this stage we propose the 2500ha of tidal flat of Aphaedo Island as a potential network site of EAAF. After several CEPA activities on Aphaedo, we really hope to enlarge our suggested FNS to whole Aphaedo including land.

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.

The tidal flat of Aphaedo Island is dominated by the finer sediment, mainly muddy sand and 182 species of macro invertebrates and 28 species of halophytes were observed in the tidal flat. During the three years of 2017-2019 Aphaedo tidal flat supports 9000 waterbirds in spring, 4500 in fall and 4300 in winter on average. It contains 300 Eurasian Oystercatchers (2.7% of subspecies of world population - 11,000) and 150 Chinese Egrets (4.3%of species of world population 3,000–4,100).

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.

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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.

G, E, D

12. Jurisdiction *:

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

Territorial : Shinan County, Functional : Ministry of Ocean and Fisheries

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.

Kim, Hana : the Department of World Heritage, Shinan County, hana4113@korea.kr, 010-7174-4113, 061-240-8642
Lee, Kyung Gyu : the Department of World Heritage, Shinan County, scops@korea.kr, 010-5582-3749, 061-240-8648
Jin, Hyun Min : Mokpo Regional Office of Ocean and Fisheries, gracekuru@korea.kr, 010-4912-1947, 061-280-1701

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.

Wetland International 2012 – *Waterbird Polulation Estimate*: *http://wpe.wetlands.org*
BirdLife International 2016. *Egretta eulophotes*. *The IUCN Red List of Threatened Species* 2016: e.T22696977A93596047. http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22696977A93596047.en. Downloaded on 05 November 2019. (English).
BirdLife International 2017. *Haematopus ostralegus* (amended version of 2016 assessment). *The IUCN Red List of Threatened Species* 2017: e.T22733462A117739875. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22733462A117739875.en. Downloaded on 05 November 2019. (English)
Chun S. S. 2005. Korean Tidal Flat. Ministry of Oceans and Fisheries. (Korean).

Hwang, B. Y. 2011. The study of breeding ecology and population genetics in the endangered species, Chinese Egret *(Egretta eulophotes)*. Doctoral thesis of Kyung Hee University. (Korean).
Hyun et al. 2018. Floristic study of Aphaedo Island in Sinan-gun, Jeollaqnam-do, Korea. Korean J. Pl. Taxon. 48: 65-99. (English).
Korea Institute of Environment Ecology. 2015. Research on the conservation and management of coastal birds. Ministry of Oceans and Fisheries. (Korean).
Lee et al. 2010. Management plan for UNESCO Shinan Dadohae Biosphere Reserve, Republic of Korea: integrative perspective on ecosystem and human resources. Journal of Ecology and Field Biology 32: 95-103.(English).
Melville, D., Gerisamov Y., Moores N., Yu Y-T. & Q. Bai. 2014. Conservation assessment of Far Eastern Oystercatcher Haematopus [ostralegus] osculans. (pp. 129-154). In Ens, B. & L. Underhill (Eds.). Conservation Status of Oystercatchers around the World. International Wader Studies 20, August 2014. International Wader Study Group. 192pp. (English).
National Institute of Fisheries Science. 2010. The 2009 survey on the Coastal wetlands. Ministry of Land, Transport and Maritime Affairs. (Korean).
NIBR. 2015. 2015 monitoring of passage migratory bird in Korea. National Institute of Biological Resources. (Korean).
NIBR. 2019. 2018-2019 Winter Waterbird Census of Korea. National Institute of Biological Resources. (Korean).
Shinan County. 2019. 2018 Shinan statistical year book. Shinan County. (English and Korean).

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.

Aphaedo shows warm-temperate climate and have 4887ha of area. Several islands had been combined as one, Aphaedo, by reclamation. About 11000 years ago when the sea level was 10-15m lower than now, the raising speed of sea level was retarded. This was a good condition to accumulate sediments which became the origin of most surface sediments of tidal flat in Aphaedo. Most sediment comes from Geumgang River and is dominated by mainly muddy sand. The tidal flat of Aphaedo could be roughly divided into three parts by the shape of the island.

16. Physical features of the catchment area:

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

Aphaedo Island has 6000ha of tidal flat. The average tide range is 269cm and the sea level is less 5m even in the highest tide. Average temperature and annual precipitation is 14.4 degree and 729mm, respectively. Although there is no river in Aphaedo, small streams and reservoirs make it possible to cultivate rice in the island.

17. Hydrological values:

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

Aphaedo Island is surrounded by tidal flats which have 5m in maximum height above sea level. Thus it helps to reduce the potential impacts of natural disasters such as typoon, tsunami, etc. Also the tidal flat could purify sewer containing organic materials from land

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 tidal flat of Aphaedo is an important habitat for waterbirds, including shorebirds, egrets, waterfowls etc. and it nurses variety of macro-invertebrates and fishes. In the spring season the tidal flat of Yellow Sea is the last place to refuel energy for their migration to the breeding sites. Aphaedo Island is located in the bottom of east Yellow Sea. Thus it is the gateway of Yellow Sea for the shorebirds using East-Australasian Flyway. For example, the shorebirds banded at least 15 different sites of EAAF were observed between 2010 and 2018 (see Appendix 2).

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)

Eighteen species of vegetation and 98 plant species were recorded including 28 salt plant species such as *Suaeda japonica, Scirpus planiculmis, and Vitex rotundifolia* on the tidal flat of Aphaedo. As protected marine species *Zostera japonica* was observed. Due to the previous reclamations on the coastal wetlands many salt plants had been disappeared. In this situation protection on the salt plants is important. Still we have not found any severe invasive species on the tidal flat of Aphaedo. However, the management plan on the wetland protected area of Aphaedo will be announced in 2020 including monitoring and removal activities on potential invasive species.

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)

More than 150 Chinese Egrets, internationally vulnerable species, regularly inhabit on Aphaedo at least two months from August to September after breeding. The world population of Chinese Egrets is estimated 3,000–4,100. Most observed Chinese Egrets are juvenile and seems to come from Younggwang Chilsando islands, the colonial breeding site of Chinese Egrets, which are located 52km away from Aphaedo. It is known that after breeding Chinese Egrets congregate on certain coasts before they colonially depart to east-south Asia for wintering. Thus Aphaedo is the first habitats for young Chinese Egrets. It is assumed that Aphaedo tidal flat offers favorable environment for Chinese Egrets: various types of prey from tidal flat and safe roosting sites such as sand dune, abandoned fishery ponds.

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:

Aphaedo Island has 4887ha of area and about 6000 residents. It is a typical fishing village; most people work for their livings on land and at sea. The tidal flats are mainly used for seaweed nursery and fishing. Seaweed nursery is located in the boundary between sea and tidal flat. Most fishing is for catching octopus using small boats or bare hands. Especially catching octopus with bare hands was designated as Nationally Important Fishery Heritage in 2018. Unlike fishing boats which can capture a lot of octopus at once, catching octopus with bare hands could be less harmful on tidal flat. It is one way to preserve a traditional fishery. It might be not be a sustainable if lots of people catch octopus with bare hands. Several

dozens of fishermen catch octopus with bare hands, and only two of them were certified as a master in Aphaedo.

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

22. Land tenure/ownership:

a) Within the Flyway Network site:

Nation

b) In the surrounding area:

Mostly private

23. Current land (including water) use:

a) Within the Flyway Network site:

Nation

b) In the surroundings/catchment:

Mostly private/ Nation

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:

No. It is not possible to reclaim the tidal flat of Aphaedo since designation of wetland protected area

b) In the surrounding area:

Possible factors, such as resorts, plants etc.

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.

Wetland protected area and UNESCO Shinan Dadohae Biosphere Reserve

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?:

Manangement plan for Shinan Dadohae Biosphere Reserve

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

Yes it is being implemented, especially focusing on the compiling of the biodiversity information on islands. Also a management plan for wetland protected area including Apheado will be published in early 2020.

d) Describe any other current management practices:

Prohibition on the tidal flat reclamation and collection on marine debris

26. Conservation measures proposed but not yet implemented:

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

27. Current scientific research and facilities:

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

1. Shorebird population counting – annually (spring and fall) conducted by National Institute for Biological Resources
2. Wintering birds population counting – annually (winter) conducted by National Institute for Biological Resources
3. Shorebird population counting – annually (spring and fall) conducted by Ministry of Oceans and Fisheries.
4. Research on the shorebird roosting sites – annually (spring and fall) conducted by Shinan County

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.

1. Posters on shorebirds flag records
2. Creating shorebirds roosting sites, building a observation hide, and education programs are planned in 2020. Construction of artificial roost sites is aim to enlarge roosting sites especially during the highest tide. The shortage of natural roosting sites is common in the west coast of Korea. The use of artificial roost sites, such as floating or fixed roosts, by shorebirds is not tested. The observation whether shorebirds use artificial roosts could be a CEPA activity.

29. Current recreation and tourism:

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

Fishing is an increasing recreational activities of Aphaedo and mainly conducted on the bridges, docks or boats. The frequency of fishing is sporadic but more frequent at weekend than week. Also its intensity is strong at spring and fall than summer or winter. Thus sometimes roosting shorebirds are disturbed by recreational fishing activities.

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.

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

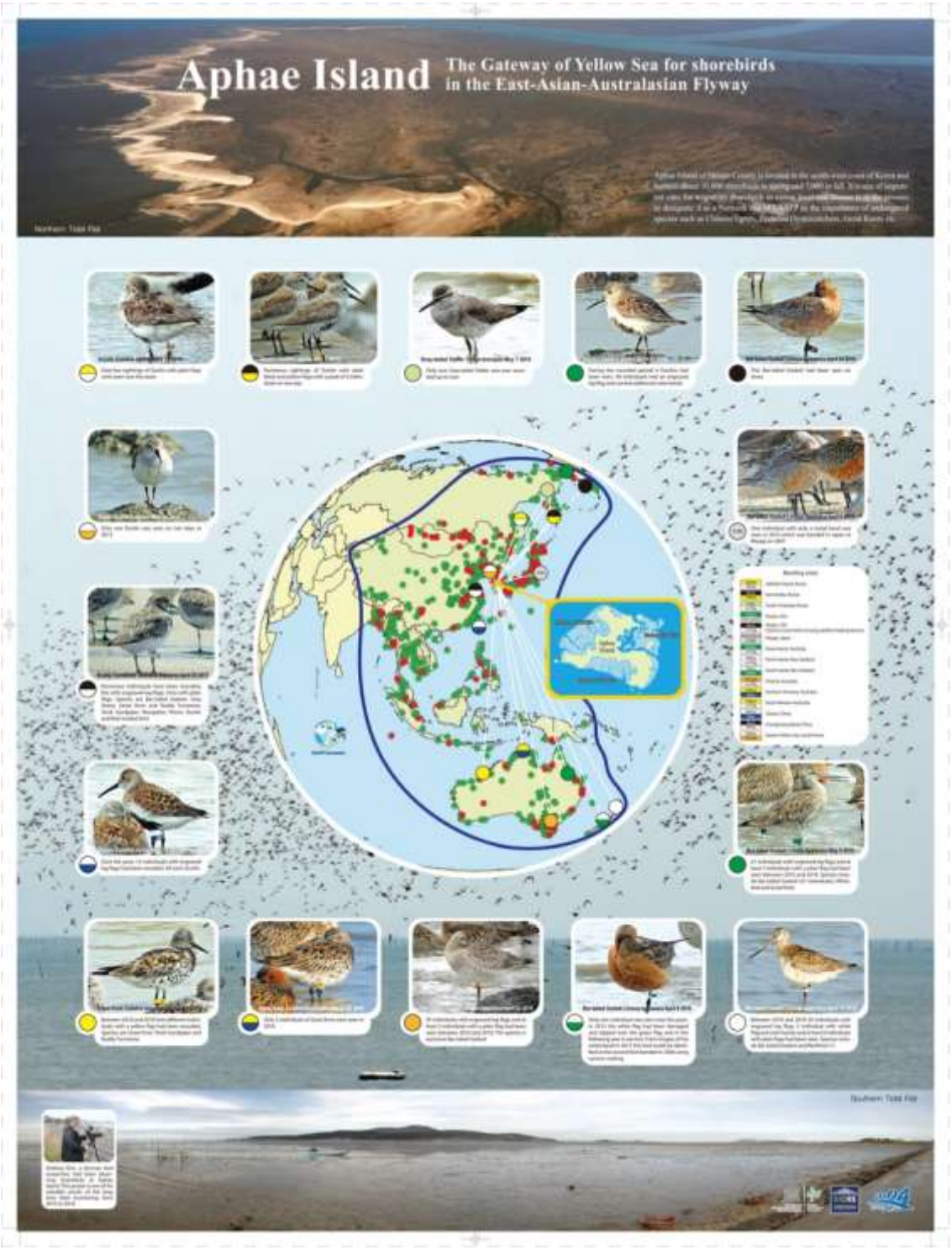
Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems.

Appendix 1. Waterbirds lists of Aphaedo Tidal Flat

No.	Scientific Name	English Name	Korean Name
1	*Anser fabalis*	Bean Goose	큰기러기
2	*Cygnus cygnus*	Whooper Swan	큰고니
3	*Tadorna tadorna*	Common Shelduck	혹부리오리
4	*Anas strepera*	Gadwall	알락오리
5	*Anas falcata*	Falcated Teal	청머리오리
6	*Anas penelope*	Eurasian Wigeon	홍머리오리
7	*Anas platyrhynchos*	Mallard	청둥오리
8	*Anas poecilorhyncha*	Spot-billed Duck	흰뺨검둥오리
9	*Anas clypeata*	Northern Shoveler	넓적부리
10	*Anas acuta*	Pintail	고방오리
11	*Anas formosa*	Baikal Teal	가창오리
12	*Anas crecca*	Common Teal	쇠오리
13	*Aythya ferina*	Pochard	흰죽지
14	*Aythya fuligula*	Tufted Duck	댕기흰죽지
15	*Aythya marila*	Greater Scaup	검은머리흰죽지
16	*Bucephala clangula*	Common Goldeneye	흰뺨오리
17	*Mergellus albellus*	Smew	흰비오리
18	*Mergus merganser*	Common Merganser	비오리
19	*Mergus serrator*	Red-breasted Merganser	바다비오리
20	*Tachybaptus ruficollis*	Little Grebe	논병아리
21	*Podiceps cristatus*	Great Crested Grebe	뿔논병아리
22	*Ciconia boyciana*	Oriental White Stork	황새
23	*Platalea leucorodia*	Eurasian Spoonbill	노랑부리저어새
24	*Platalea minor*	Black-faced Spoonbill	저어새
25	*Butorides striata*	Striated Heron	검은댕기해오라기
26	*Bubulcus ibis*	Cattle Egret	황로
27	*Ardea cinerea*	Grey Heron	왜가리
28	*Ardea alba*	Great White Egret	중대백로
29	*Egretta intermedia*	Intermediate Egret	중백로
30	*Egretta garzetta*	Little Egret	쇠백로
31	*Egretta eulophotes*	Chinese Egret	노랑부리백로
32	*Phalacrocorax carbo*	Great Cormorant	민물가마우지
33	*Falco tinnunculus*	Common Kestrel	황조롱이
34	*Falco columbarius*	Merlin	쇠황조롱이
35	*Falco subbuteo*	Eurasian Hobby	새호리기
36	*Falco peregrinus*	Peregrine Falcon	매
37	*Pandion haliaetus*	Osprey	물수리
38	*Accipiter soloensis*	Chinese Sparrowhawk	붉은배새매
39	*Accipiter gularis*	Japanese Lesser Sparrowhawk	조롱이

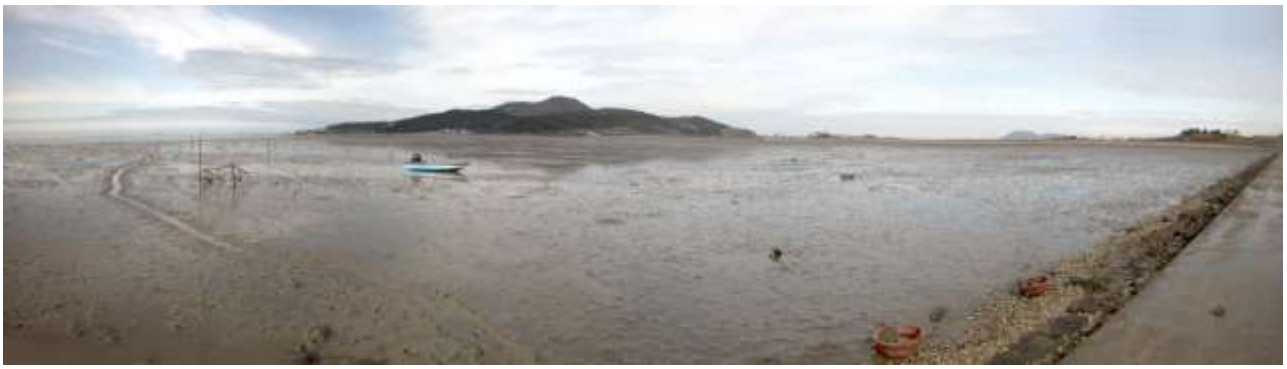
40	*Accipiter nisus*	Eurasian Sparrowhawk	새매
41	*Buteo buteo*	Common Buzzard	말똥가리
42	*Gallinula chloropus*	Moorhen	쇠물닭
43	*Fulica atra*	Coot	물닭
44	*Haematopus ostralegus*	Eurasian Oystercatcher	검은머리물떼새
45	*Pluvialis fulva*	Pacific Golden Plover	검은가슴물떼새
46	*Pluvialis squatarola*	Grey Plover	개꿩
47	*Charadrius dubius*	Little Ringed Plover	꼬마물떼새
48	*Charadrius alexandrinus*	Kentish Plover	흰물떼새
49	*Charadrius mongolus*	Mongolian Plover	왕눈물떼새
50	*Gallinago gallinago*	Common Snipe	꺅도요
51	*Limosa limosa*	Black-tailed Godwit	흑꼬리도요
52	*Limosa lapponica*	Bar-tailed Godwit	큰뒷부리도요
53	*Numenius phaeopus*	Whimbrel	중부리도요
54	*Numenius arquata*	Eurasian Curlew	마도요
55	*Numenius madagascariensis*	Far Eastern Curlew	알락꼬리마도요
56	*Tringa erythropus*	Spotted Redshank	학도요
57	*Tringa totanus*	Redshank	붉은발도요
58	*Tringa stagnatilis*	Marsh Sandpiper	쇠청다리도요
59	*Tringa nebularia*	Greenshank	청다리도요
60	*Tringa ochropus*	Green Sandpiper	삑삑도요
61	*Tringa glareola*	Wood Sandpiper	알락도요
62	*Xenus cinereus*	Terek Sandpiper	뒷부리도요
63	*Actitis hypoleucos*	Common Sandpiper	깝작도요
64	*Heteroscelus brevipes*	Grey-tailed Tattler	노랑발도요
65	*Arenaria interpres*	Ruddy Turnstone	꼬까도요
66	*Calidris tenuirostris*	Great Knot	붉은어깨도요
67	*Calidris canutus*	Red Knot	붉은가슴도요
68	*Calidris alba*	Sanderling	세가락도요
69	*Calidris ruficollis*	Red-necked Stint	좀도요
70	*Calidris subminuta*	Long-toed Stint	종달도요
71	*Calidris ferruginea*	Curlew Sandpiper	붉은갯도요
72	*Calidris alpina*	Dunlin	민물도요
73	*Limicola falcinellus*	Broad-billed Sandpiper	송곳부리도요
74	*Larus crassirostris*	Black-tailed Gull	괭이갈매기
75	*Larus canus*	Mew Gull	갈매기
76	*Larus argentatus*	Herring Gull	재갈매기
77	*Larus ridibundus*	Black-headed Gull	붉은부리갈매기
78	*Larus saundersi*	Saunders` Gull	검은머리갈매기
79	*Sterna hirundo*	Common Tern	제비갈매기
80	*Sterna albifrons*	Little Tern	쇠제비갈매기

Appendix 2. A Poster on the banded shorebirds of Aphaedo Tidal Flat

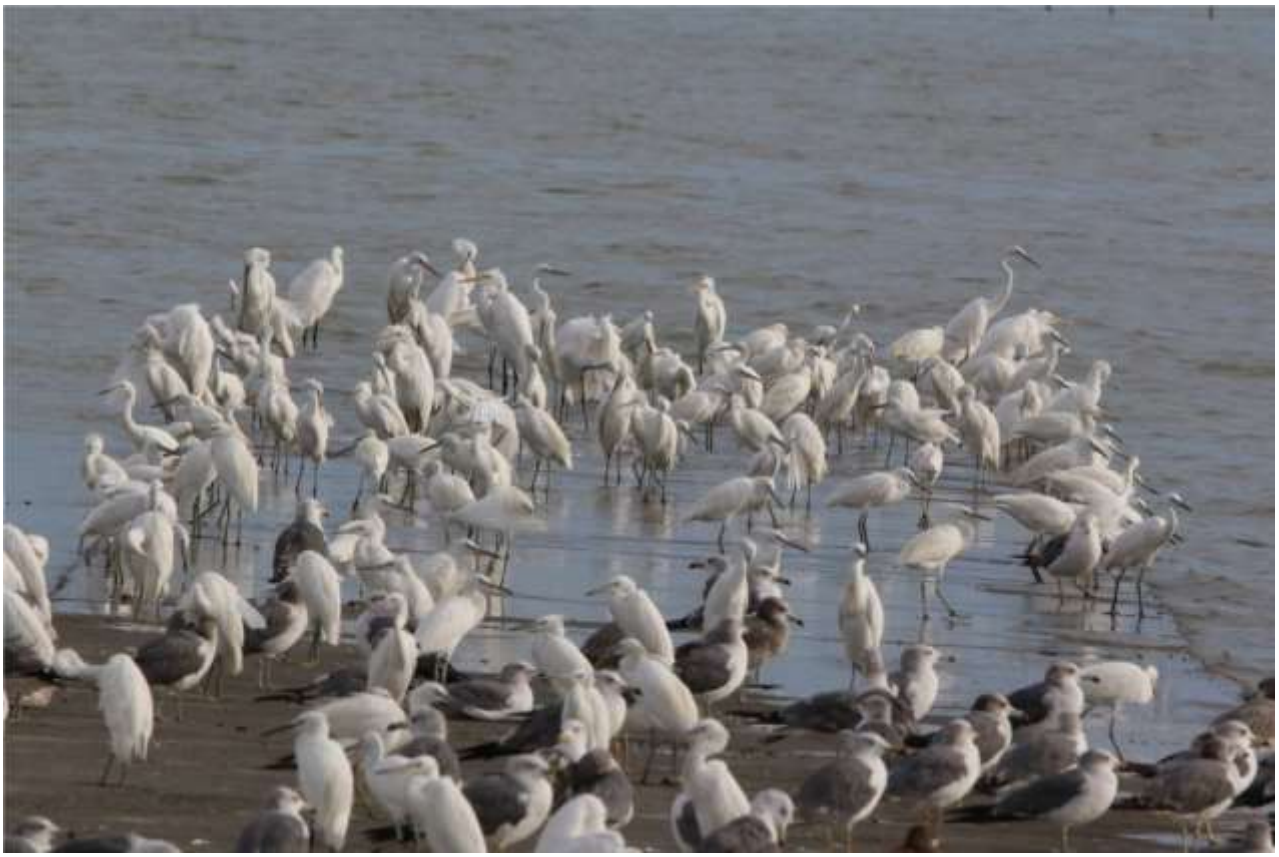


Appendix 3. Photos on the tidal flat and birds of Aphaedo

North Tidal Flat of Aphaedo Island



South Tidal Flat of Aphaedo Island



Chinese Egrets of South Tidal Flat of Aphaedo Island