

# Nakdong Estuary Republic of Korea

EAAF NETWORK SITE CODE FOR OFFICE USE ONLY:



# 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:

- 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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# Compiler 2

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## 2. Date this sheet was completed \*:

DD/MM/YYYY

30/10/2018

## 3. Country \*:

Republic of Korea

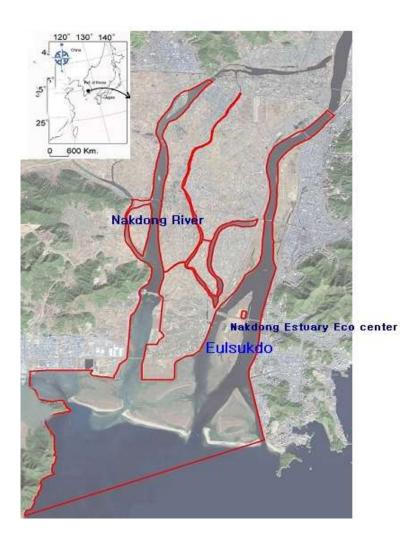
## 4. Name of the Flyway Network site \*:

Accepted English transcription of the Site's name.

Nakdong Estuary

## 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 <u>here</u>.



## 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.

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Latitude: 33°03' -13N,
Longitude: 128°48' -129' 00E
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## 7. Elevation \*: (in metres: average and/or maximum & minimum)

## Average 3m, Maximum 7m, Minimun 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.

#### Total area of Site 8,849ha

## 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 Nakdong estuary creates a unique landscape of the tideland at ebb tide and the estuary at high tide with various sandilands (Eulsuk-do, Daema-deung, Jangja-do, Baekhap-deung, Sinja-do, Mumyeong-do, Jinwu-do, etc.) and marshy grounds with the broad range for the ebb and flow of the tide. In addition, it plays a role as an important gate and destination for migratory birds since it is located at the southern part of the Korean peninsular. It is suitable as a place for winter visitors and a breeding place for summer visitors since it is warm in winter and cool in summer. Like this, the Nakdong estuary is a world class treasure place of migratory birds as well as the largest one in the East because it has all of three elements of feed conditions, geographical conditions and climate conditions.

## 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.

Criterion 2: Supports internationally important species.
EN (Endangered) 5 species : Egretta eulophotes, Ciconia boyciana, Haliaeetus pelagicus, Platalea minor, Haematopus ostralegus osculans
VU (Vulnerable) 16 species : Anser cygnoid, Cygnus cygnus etc
Criterion 5: Regularly supports about 50,000 migratory waterbirds.
\* Busan Metropolitan City, 2016-2017. Nakdong estuary ecosystem monitoring.

## 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.

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E – Sand, shingle or pebble shoresF – Estuarine watersH – Intertidal marshes
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## 12. Jurisdiction \*:

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

Busan Metropolitan City, Saha-gu, Sasang-gu, Gangseo-gu, Bsbuk-gu

## 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.

Busan Metropolitan City, Minister of Environment, Cultural Properties Administration, Ministry of Land, Transport and Maritime Affairs

## 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.

Hong S. B., 2004. Regional Characteristics of Bird in Nakdong Estuary. Kor. J. Orni. 11(2): 55-70 Hahm K. H., 2003. A Bird Population and Species in Naktong-river estuary of Change in the duration last ten years(1988, 1903, 1998). Kor. J. Orni. 10(2):69-76. Busan Metropolitan City, 2003-2017. Nakdong estuary ecosystem monitoring.

## 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.

This area open to the Straits of Korea is made of thick earth and sand of average over 60m carried by Nakdong river(525km) through the geological age of over 10,000 years. A delta at the estuary consisting of big and small sandbanks is stretched toward Nakdong river with about 32km north and south, and 6-12km east and west.

## 16. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate

(including climate type).

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Surface area: 8,849 ha
Average air temperature: 15.33 °C
Precipitation: 1,276 mm
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## 17. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping,

shoreline stabilization, etc.

Providing agricultural water to surrounding cultivated land Adjusting water level: Control by opening the floodgate at the estuary and dredging earth and sand

## 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.

It provides wintering site, breeding place and stopover site for the migratory birds. The dominants vegetation type is aquatic plant. As designated as national wetland conservation site, fishing is restricted thus it provides resting and feeding place for waterbirds.

#### Plant: 413 species include unique aquatic plants

- Phragmites communis, Carex kobomugi, Carex pumila, Scirpus triqueter, Cynodon dactylon, Lathyrus japonicus, Suaeda glauca, Rumex crispus etc.

Fish: 45 species

- Mugil cephalus, Konosirus punctatus, Lateolabrax japonicus, Trachurus japonicus etc. Mammal : 7 species

- Hydropotes inermis argyropus, Nyctereutes procyonoides koreensis, Mustela sibirica etc. Reptile : 10 species

- Eremias argus, Takydromus wolteri, Natrix tigrina lateralis, Elaphe rufodorsata etc. Amphibia : 7 species

- Hyla arborea japonica, Rana nigromaculata, Rana catesbeiana etc.

## 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)

Prickly water lily forms a colony, which is designated as 2<sup>nd</sup> endangered species from MOE. Except this, there are lots of nationally designated endangered plants. The colony of willow trees naturally grows on the edge of the wetland bank area and provides wonderful scenic view.

## 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)

It is critical habitat for endemic spices such as mammal spices such as *Felis bengalensiseuptilura, Lutra lutra,* designated as nationally endangered spices. Generally, it provided shelter for various animals with full of Biodiversity.

#### 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:

#### Social values

The Nakdong estuary is located in Busan Metropolitan City, the second largest city in Korea, and can be easily accessed via various means of transportation including airplane, train and ship. Many people visit the Center in order to experience natural environment of the Nakdong estuary, and they learn many things about migratory birds, plant and the estuary environment.

#### **Cultural importance**

The Nakdong estuary is important as a migratory bird sanctuary by being designated as Natural

Monument No. 179, and provides various things to see with the remains and relics of the prehistoric age that are well preserved.

**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 **D** 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:

Possessed by the nation and local governments

b) In the surrounding area:

Possessed privately

## 23. Current land (including water) use:

a) Within the Flyway Network site:

Providing agricultural water, fishery, aquaculture

b) In the surroundings/catchment:

Agriculture, manufacturing, residential area

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:

b) In the surrounding area: Residential area, Industrial complex

## 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.

Cultural Asset Conservation area, Nation Wetland Conservation Area, Natural Environment Conservation Area			
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?:			
Conservation Management Plan was set and implemented from national and local level as National Wetland Conservation area and Cultural Asset Conservation area.			
If yes, is it being implemented?: If no, is one being planned?			
d) Describe any other current management practices:			

## 26. Conservation measures proposed but not yet implemented:

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

Currently, there is no publicly registered management master plan.

# 27. Current scientific research and facilities:

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

Since 2003, Currently Metropolitan City has been implemented migratory birds counting and monitoring.

# 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.

There are visit centre and educational facilities around the estuary and enhanced to increase the public awareness.

# 29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity. Supposed to gradually increase the number of visitors by promoting ecotourism.

# 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		$\boxtimes$	

commercial and industrial areas		$\boxtimes$	
tourism and recreation areas		$\boxtimes$	
Agriculture and aquaculture			
annual and perennial non-timber crops			
wood and pulp plantations	$\boxtimes$		
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		$\bowtie$	
Biological resource use			
hunting and collecting terrestrial animals			
gathering terrestrial plants	$\square$		
logging and wood harvesting			
fishing and harvesting aquatic resources		$\boxtimes$	
Human intrusions and disturbance			
recreational activities		$\bowtie$	
war, civil unrest and military exercises			
work and other activities		$\square$	
Natural system modifications			
fire and fire suppression			
dams and water management/use		$\square$	
other ecosystem modifications			$\square$
Invasive and other problematic species and genes			

invasive non-native/alien species		$\boxtimes$	
problematic native species			
introduced genetic material			
Pollution			
household sewage and urban waste water		$\square$	
industrial and military effluents			
agricultural and forestry effluents		$\boxtimes$	
garbage and solid waste	$\boxtimes$		
air-borne pollutants			
excess energy			
Geological events			
volcanoes			
earthquakes/tsunamis			
avalanches/landslides			
Climate change and severe weather			
habitat shifting and alteration			$\square$
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 supports1% 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.
В	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.
l	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.
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- 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.

Permanent saline/brackish/alkaline marshes/pools. Sp --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. Forested peatlands; peatswamp forests. Хр --Y --Freshwater springs; oases. **Geothermal wetlands** Zg --Zk(b) -Karst and other subterranean hydrological systems, inland

Seasonal/intermittent saline/brackish/alkaline lakes and flats.

<u>Note</u>: "**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

R --

- 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.

#### la 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.