Janghang Wetland

Republic of Korea

EAAF NETWORK SITE CODE FOR OFFICE USE ONLY:

E	A	A	F	1	4	3

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

Full name:

Kyoung-Hee LEE

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2. Date this sheet was completed *:

DD/MM/YYYY

05/11/2018

3. Country *:

Republic of Korea

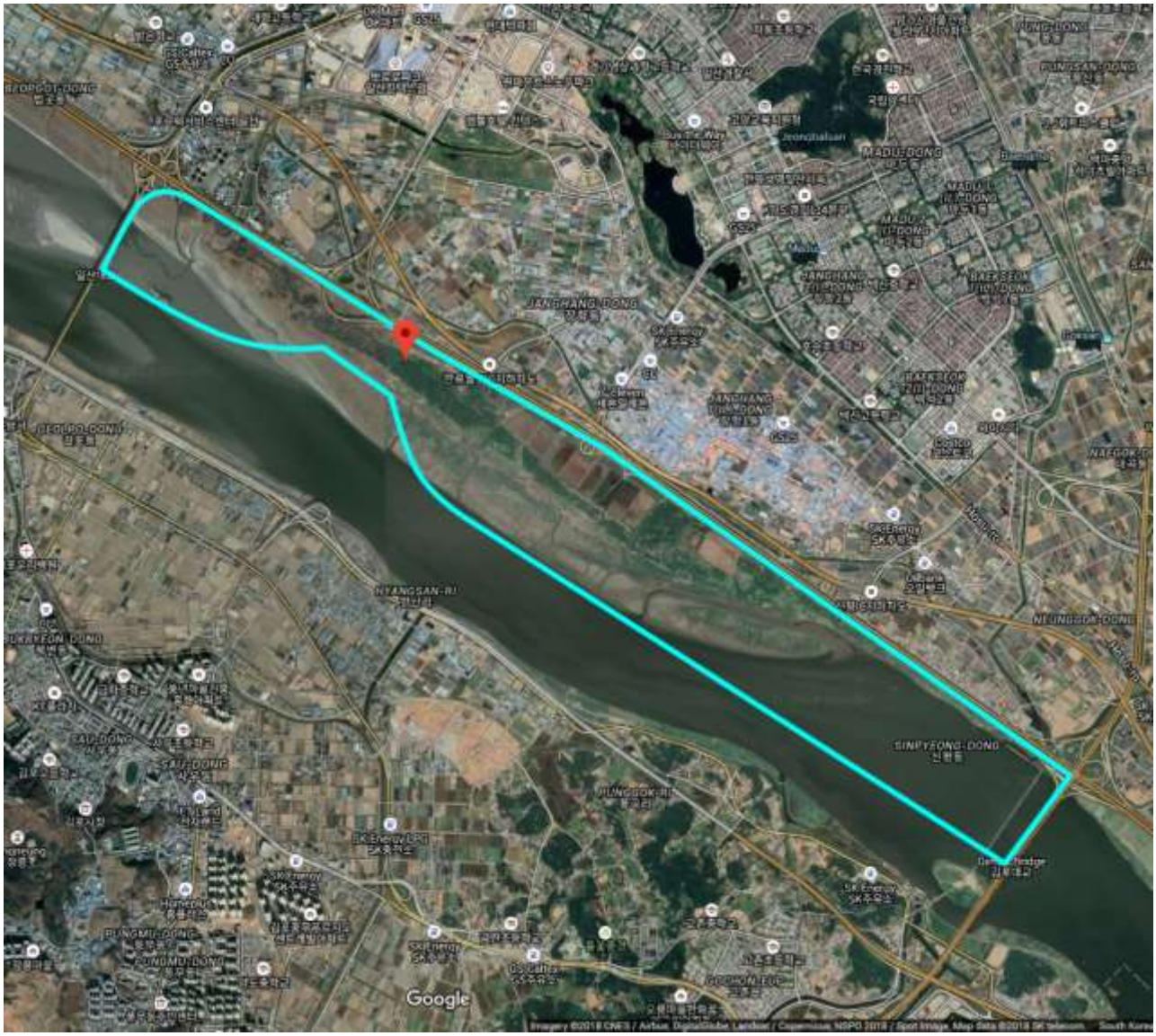
4. Name of the Flyway Network site *:

Accepted English transcription of the Site's name.

Janghang Wetland

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.

37° 38′ 17N / 126° 45′ 47″ E

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

Maximum 3.2m/Minimum 0.0m MSL

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.

749.4 hectares (=7.494 km^2)

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 Janghang Wetland, located in the Han River estuary at the trans-boundary between South and North Korea, is restricted against unnecessary population movements (Civilian Controlled Zone, CCZ). This area, which is one of the well-preserved, large river natural estuaries in Korea, is a National Wetland Protected Area, covers part of Sinpyeong-dong in Deogyang-gu, a part of Janghang-dong in Ilsandong-gu, and a part of Songpo-dong in Ilsanseo-gu, Goyang City.

The Janghang Wetland, as a tidal forested wetland located in the upper region of the brackish water zone, has the only ecosystem of the estuarine willow forest which was found symbiosis between willow (*Salix subfragilis*) and dehanni crab (*Chiromantes dehanni*) population in Korea. It is important that numerous kinds of Korean endangered species (*Antigon vipio, Anser fabalis, Platalea minor, Anser sygnoides,* etc) live in this wetland. And some people earn their livelihood by farming and fishing in this place.

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 Janghang Wetland regularly supports M 21,529 (2012~2017) birds, and 34,409 migratory water bird (2017), and max. number of geese 140,000 (2017) (2018, Goyang city)

It is inhabited by White-naped Crane (*Antigon vipio*: IUCN Red List VU, CITES I), Hooded Crane (*Grus monacha*: IUCN Red List VU, CITES I), Black-faced Spoonbill (*Platalea minor*: IUCN Red List EN), Swan

Goose (*Anser cygnoides*: IUCN Red List VU), and White-tailed Sea Eagles (*Haliaeetus albicilla*: CITES I).

It supported 38 Black-faced Spoonbill (*Platalea minor*) (1.6%) (2017), M 110 White-naped Crane (*Antigon vipio*) (2.9%~2.4%) (2012~2018)

The total species number of birds is 71 species (2017), and M 70 (2013~2017), and the total species number of waterbirds is 38 (2017).

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.

I, F

12. Jurisdiction *:

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

Executive / Goyang City
Functional jurisdiction / Ministry of Environment

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.

Goyang City Department of Environmental Protection. Address : 13-5, Goyangsicheong-ro, Deogyang-gu, Goyang-si, Gyeonggi-do, Republic of Korea. The person in charge: UnYeon KIM (Chief of the Office) 소장 김운영 /+82-31-8075-2028

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.

- Goyang City. 2018. Janghang Wetland development strategy.
- Goyang City. 2018. Janghang Wetland Citizen Ecological Monitoring Report.
- Han River Basin Environment Agency. 2015. 2015 Han Estuary Wetland Protection Area 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.

■ Geographical Characteristics and Nature

The Janghang Wetland is located on the upper part of the brackish water zone of the Han River estuary in the middle of the western coast of Korea. It was a riverine island in the past, but currently it composed of tidal willow forested wetland, estuarine sedge-reed bed marsh and tidal sand and mudflat.

■ Soil Type

A large amount of soils have flowed in from the river mouth and been deposited on the Janghang Wetland area, developing very broad sedimentary facies consisting of sand and mud. In terms of content ratio of the sediments, sand is predominant.

■ Water Quality

The range of salinity change is 0.3~0.5psu, and the range of dissolved oxygen (DO) is 7.6 - 7.9mg/L, showing the average value of 7.8mg/L. The range of chemical oxygen demand (COD) is 2.43 - 6.71mg/L, showing the average value of 4.67mg/L. The range of hydrogen ion concentration (pH) is 7.6 - 7.8, showing the average value of 7.7.

■ Tidal Variability

The maximum tidal range of the Janghang Wetland is 415㎝, and the speed of tidal current is 194cm/s - 364 cm/s.

■ Downstream Region

The rivers flowing into the Janghang Wetland are the main stream of Han River and short tributaries with relatively less amount of water (Daejangcheon, Hangsincheon, Dochoncheon and Jungangcheon Streams). The overall water amount is abundant.

■ General Climate

The annual average temperature from 1971 to 2010 is 11.0℃ - 12.5℃. The annual average precipitation is 1,234mm - 1,450mm, 50 - 60% of which is concentrated in summer (June - August). The average wind speed is 2.3m/s at the upper part of Han River estuary and 1.7m/s at the lower part. The west-northwest wind in winter and the west wind series in summer are predominant.

16. Physical features of the catchment area:

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

■ Topographic Features

The Han River estuary including the Janghang Wetland is located in Gyeonggi Bay and covering a part of Goyang City, Paju City, Gimpo City and Ganghwa City. Its northern part is bordered by North Korea and the southern part is bordered by Seoul. The coastal area is connected to the tidal flats of the central part of the West Sea (Yellow Sea), and the inland area is artificially divided from the river by the underwater barrage. In addition, the catchment of the Janghang Wetland includes the city of Seoul.

■ General Soil Type

As a sufficient amount of sediments has flowed from the rivers in the area of Han Estuary into the wetland and the tidal difference reached 8.1m, the tidal flats have developed with the islands including Ganghwado Island as the center.

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■ Climate Type

As it is located in the temperate coastal climate area with 4 seasons and in the buffer zone of Han River crossing the central part of the Korean Peninsula, the wetland is under influence of sea and land. The annual average temperature is 11.0 - 12.5℃, the highest temperature 29.5℃ in August, and the lowest temperature –6.1℃ in January.

17. Hydrological values:

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

The Janghang Wetland is strongly influenced by freshwater because abundant water is supplied from Han River from the upstream direction. Water circulation is made with the seawater flowing from the west coast according to the tide. In the brackish water zone formed in this way, the waves are not active but the tidal current is dominant due to the big tidal difference. It is a natural estuary area where the flows of fresh water and salt water are not blocked by the artificial structures, making it the last remaining brackish water zone with the estuarine integrity of Korean major rivers.

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 willow (*Salix subfragilis*) community becomes the habitat of benthos (*Chiromantes dehaani, Anguilla japonica*) and the breeding site of egrets (*Egretta* spp.). The tidal willow forest provides Goyang City with the functions of temperature control, carbon reduction, waterfront protection, and so on. Birds such as the vulnerable White-naped Crane (*A.vipio*) and the nationally threatened Bean goose (*A. fabalis*) feed on the benthos and sedge grass Sae-seom-mae-ja-gi (*Scirpus planiculmis*) living in the tidal flats and marsh. The Janghang Wetland is a highly productive wetland that supports the endangered wildlife.

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)

There are 391 species of plants. The dominant species are erect willow (*S.subfragilis*) community. erect willow (*S.subfragilis*) community is dominant in the tree layer, pussy willow (*Salix gracilistyla*) and winnow willow (*Salix koriyanagi* for. *koriyangagi*) are dominant in the shrub layer, and reed (*Phragmites communis*), water pepper (*Persicaria hydropiper*), reed canary grass (*Phalaris arundinacea*) and wood small reed (*Calamagrostis epigeios*) are dominant in the grass layer, appearing as companion species. In the waterside area and backwater marsh, there are palustrine wetlands with reed (*P. communis*), Manchurian wild rice *(Zizania latifolia*), broad-leaf phacelurus (*Phracelurus latifolius*), rooting bulrush (*Scirpus radicans*), Scabrous-leaf sedge (*Carex scabrifolia*), triangular bulrush (*Scirpus tirqueter*), Sae-seom-mae-ja-gi (*S.planiculmis*), wood small reed (*Calamagrostis epigeios*), and so on.

Erect willow (*S. subfragilis*) forming the wet forest is important as the food source of the animal species including dehanni crab (*C.dehaani*) and Sae-seom-mae-ja-gi (*S.planiculmis*) which is important as a food plant providing White-naped Crane (*A.vipio*) and other birds with its stem and tubers. Manchurian wild rice (*Z.latifolia*) is formed along the waterside to be the main food source of bean geese. It is the best place to investigate the interrelationship among the plants because it is the highest estuary habitat of the salt plants such as broad-leaf phacelurus (*P.latifolius*) and sea-blite (*Suaeda maritimae*) and the lowest estuary habitat of erect willow (*S.subfragilis*)

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)

In the Janghang Wetland, 122 species of birds were recorded from 2012 to 2017, 11 species of mammals, 64 species of land insect, 5 species of spiders, 17 species of amphibians and reptiles, 63 species of benthic macro-invertebrate, and 37 species of fish. Among 122 species of birds in the Janghang Wetland, White-naped Crane (*A.vipio*) and Bean goose (*A. fabalis*), Black-faced Spoonbill (*Platalea minor*), gulls (*Larus* spp.), Dunlin (*Calidris alpine*) and Black-bellied Plover (*Pluvialis squatarola*) feed on the estuary lugworm (*Hediste japonica*), mud crab (*Ilyoplax deschampis*) and so on in the mudflats. As about 100 Korean water deer (*Hydropotes inermis*) inhabit in a group in the wetland, it is highly worthy of eco-tourism and eco-education.

The largest habitat of dehanni crab (*C.dehaani*) on the west coast is where erect willow (*S.subfragilis*) community are concentrated. The main food is the willow leaves, and the willow can be easily expanded thanks to the roots. As the mud crab (*I.deschampis*) is a species that feeds on the organic matters in the sediments deposited in the river side mud flats, it can be called an important “purifier” of the estuary.

The Janghang Wetland, as an ecological transitional zone where fresh water and salt water meet, has high productivity and biological diversity. Of the 37 species of fish, those with the value within the fishery are eel (*Anguilla japonica*), so-iyu mullet (*Mugil haematocheilus*), river puffer (*Takifugu obscurus*) and estuary tailfin anchovy(*Coilia mystu*). Especially the eel fries have a great economic value. Chinese mitten crab (*Eriocheir sinensis*) is a major income source for fishermen, and dehanni crab (*C.dehaani*) is of high value in tourism and education due to its symbiotic relationship with erect willow *(S.fragilis*) community.

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:

The total population of Goyang City is 1,400,000, the number of farmers are 17,000, the number of farmers in the Janghang Wetland is 8 people and the number of fishing boats engaged in fishing is 40. The value of seafood produced in the Janghang Wetland was estimated to be about KRW 500 mil. - 600 mil.

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)

It is an area where wildlife habitat has been well preserved because civilian access has been controlled due to the military bases on the riverbanks of the Han River and military wire fences. But the military bases and the wire fences were partially removed recently, it is required to control visitors' access not to damage to the wetland.

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:

National lands

b) In the surrounding area:

Private lands and National lands

23. Current land (including water) use:

a) Within the Flyway Network site:

1) The main use of the area is fishing by 40 boats.
2) *Anguilla japonica* fishing by rectangular set net is done in the willow forest
3) There are a rice paddy of which area is more than 0.25 square Kilometers

b) In the surroundings/catchment:

The surrounding population is 9,820,000 in Seoul, 406,000 in Gimpo city, 433,000 in Paju, and 68,800 in Ganghwa-gun, and the metropolitan city, Gimpo city and Paju city are under development. Tourism industry and making artificial waterways Is increasing

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:

Conservation It is concerned about water pollution caused by agriculture, reduction of fishery resources due to overfishing, and damage caused by waste water. There is a concern that ecosystem can be disturbed due to high ecotourism demand due to the removal of military bases and military wire fences.

b) In the surrounding area:

■ A plan to remove the underwater barrage on the upper part of the wetland is under review. It is expected that the intertidal zone will be flooded and the ecosystem of the wetland forest will be changed.

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.

National protection: National wetland protected area (April 17, 2006)
International protection : World Heritage or UNESCO Biosphere Reserve - N/A
Yellow Sea. LME. 2006. Large Marine Ecosystems: information portal. (www.lme.noaa.gov/Portal/). Important Bird Area (IBA) (www.birdlife.org/datazone/info/ibasasia)

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?

Yes

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

The Han River Estuary Janghang Wetland Development Plan (Goyang City, 2018) has been established, a consultative group has been organized and operated, a project to create organism habitat by removal of invasive alien plants, purification activities, feeding of migratory birds and creation of rice fields are in progress, and programs to strengthen the carrying capacity of wintering birds (확인요망) are operated.

d) Describe any other current management practices:

Ecological monitoring by citizen's scientist and local NGO and biodiversity management contract with local farmers following recommendation of the Convention on Biological Diversity are implemented.

26. Conservation measures proposed but not yet implemented:

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

A project to remove the chain link fence on the Han River Estuary is under promotion, and a project to construct searchlight facilities and ecological trails in the wetland will be promoted after removal of the chain link fence. In addition, a project to build a Janghang Wetland Ecological Learning Center using the unused land around the wetland is under consideration.

27. Current scientific research and facilities:

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

Janghang wetland development strategy (2018, Goyang City)
Janghang wetland citizen ecological monitoring report (2018, Goyang City)`

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.

• Ecological Experience Education Project In Cooperation with the Environmental Groups
• Development of Janghang Wetland environmental experience program and publication of educational materials

• Feeding birds (e.g. White-naped cranes and Bean gese) in winter and monitoring by CCTV
• Installation of Janghang Wetland Visitor Center
• Janghang Wetland brand trademark application, and production of promotional materials such as eco bags, etc.
• Making a website and a promotional video

29. Current recreation and tourism:

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

Ecological education programs were held 101 times, and 2,333 people attended (2017).

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.