

Designation date: 16/10/2013 Ramsar Site no. 2187

Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

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Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 17, 4th edition).
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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Designation date

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Site Reference Number

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2. Date this sheet was completed/updated:

October 20, 2012

3. Country:

The People's Republic of China

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Shandong Yellow River Delta Wetland

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or
b) Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or
ii) the boundary has been extended ; or
iii) the boundary has been restricted**

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or
ii) the area has been extended ; or
iii) the area has been reduced**

** **Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a hard copy (required for inclusion of site in the Ramsar List): ;
- ii) an electronic format (e.g. a JPEG or ArcView image) ;
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

Shandong Yellow River Delta Wetland is located in the Yellow River National Nature Reserve of Shandong Province. The wetland is composed of two parts.

The southern part is located at two sides of the current Yellow River course. The western boundary of this area starts from the external wall of Gudong Oilfield, extends from north to south, passes through Zhongxing Road then crosses the Yellow River and follows the Fengyu ditch southward to the south dam of the Yellow River dyke. The West boundary then continues westward to the No. 14 sluice along the wave wall and then eastward to the sea along the Xiaodao River. The eastern boundary is the -3m line of sea.

The northern part of the Yellow River Delta Wetland is located at the Diaokou River, the former mouth of the Yellow River before it shifted in 1976. The western boundary of the area is bound by the Diaokou River Road. The southern boundary is a diversion channel for the ecological water supplement. The eastern boundary is the western-most road of the 106 Oilfield operating area. The northern boundary is the 3m depth isobath line of sea

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

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

The southern area (Dawenliu and Huanghekou area):

Centre: 37°42'18"N, 119°9'02"E

Extent: 37°33'14" - 37°54'03"N, 118°57'06" - 119°20'12"E

The northern area (Yiqianer area):

Centre: 38°8'26"N, 118°42'47"E

Extent: 38°4'06" - 38°12'24"N, 118°38'40" - 118°46'17"E

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

The site is located at the estuary of the Yellow River in the northeastern of Dongying City, Shandong Province, and near the Bohai Sea to the north and the Laizhou Bay to the east, with about 70 km's distance to Dongying City.

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

Average: 3 m;

maximum: 5 m;

minimum: -3 m.

11. Area: (in hectares)

The total area is 95,949.9 ha. The southern area is 81,776.7 ha accounting for 85.2% of the total area; the northern area is 14,173.2 ha, accounting for 14.8% of the total area.

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Shandong Yellow River Delta Wetland is an alluvial plain formed by the Yellow River, which carries huge amount of sediment to the Bohai Bay Depression annually. The extensive estuary ecosystem is mainly composed of shallow estuarine waters, tidal flats, marshes, reed swamps, canals and drainage channels, and aquaculture ponds. It is an almost intact estuary wetland, with one of the fastest natural land increase rates in the world. Many globally threatened species, such as Siberian Crane *Leucogeranus leucogeranus*, Oriental Stork *Ciconia boyciana* and Black-faced Spoonbill *Platalea minor* can be observed. More than 1 million birds, belonging to 367 species of birds have been recorded in this area. The wetland is an important stopover, wintering ground and breeding site for the migrating birds from East Asia to Australia. The wetland is just in its primary state of generation, development and succession, which makes it an ideal place for studying the structure, function, development and succession of wetland ecosystems.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1:

The Shandong Yellow River Delta Wetland is an almost naturally intact estuary wetland composed of shallow estuarine waters, tidal flats, marshes, reed swamps, canals and drainage channels, and aquaculture ponds situated at the mouth of Yellow River estuary. It has an annual accretion rate of 32.4 km² which is one of the fastest natural land increase rates in the world. This is due to the large amount of sediment brought down by the Yellow River and deposited in the Bohai Bay depression. There are 26751.2 ha shallow sea area, 38890.7 ha marshes, and 26513.5 ha weed swamp in the wetland. The wetland is one of the best examples of an estuary wetland of the biogeographic region.

Criterion 2:

The rare and endangered species distributing in the wetlands and corresponding applicable standards are listed in the table below:

Species name	Latin Name	IUCN	CMS	CITES	National Protection Class
Birds					
Siberian Crane	<i>Leucogeranus leucogeranus</i>	CR	I/II	I	I
Red-crowned Crane	<i>Grus japonensis</i>	EN	I/II	I	I

Oriental Stork	<i>Ciconia boyciana</i>	EN	I	I	I
Black-faced Spoonbill	<i>Platalea minor</i>	EN	I	—	II
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	I/II	I	II
Scaly-sided Merganser	<i>Mergus squamatus</i>	EN	—	—	I
Hooded Crane	<i>Grus monacha</i>	VU	I/II	I	I
White-naped Crane	<i>Grus vipio</i>	VU	I/II	I	II
Dalmatian Pelican	<i>Pelecanus crispus</i>	VU	I/II	I	—
Great Bustard	<i>Otis tarda</i>	VU	I/II	II	I
Relict Gull	<i>Larus relictus</i>	VU	I	I	I
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	VU	I/II	II	I
Saunders's Gull	<i>Larus saundersi</i>	VU	I	—	—
Far Eastern Curlew	<i>Numenius madagascariensis</i>	VU	I/II	—	—
Great Knot	<i>Calidris tenuirostris</i>	VU	II	—	—
Fish					
Yangtze Sturgeon	<i>Acipenser dabryanus</i>	CR	—	II	I
Chinese Paddlefish	<i>Psephurus gladius</i>	CR	II	—	I
Reptiles					
Leatherback	<i>Dermochelys coriacea</i>	CR	I	I	I
Mammals					
Indo-Pacific Finless Porpoise	<i>Neophocaena phocaenoides</i>	VU	II	I	I

Criterion 4 :

The Shandong Yellow River Delta Wetland is an intermediate stopover and a key point for the bird migration along the East Asian – Australasian Flyway. It is an important stopover, wintering and breeding ground for migratory birds. Many rare and endangered birds breed or winter here. The wetland is an important wintering site for 26 kinds of birds, such as *Grus japonensis*, *Grus grus* and other species, and stopover for *Grus vipio*, *Grus monacha* and *Grus leucogeranus*. The wetland is an important breeding site for *Ciconia boyciana*, 32 pairs of *Ciconia boyciana* were found to breed here. It is also one of the three biggest breeding grounds for the Saunders's Gull *Larus saundersi* with approximately 1450 breeding population in 2010 and 2800 in 2013.

There are 26 kinds of birds wintering at the site as follows:

NO.	Species	Latin Name
1	Mute Swan	<i>Cygnus olor</i>
2	Whooper Swan	<i>Cygnus cygnus</i>
3	Tundra Swan	<i>Cygnus columbianus</i>
4	Bean Goose	<i>Anser fabalis</i>
5	Graylag Goose	<i>Anser anser</i>
6	Eurasian Wigeon	<i>Anas penelope</i>
7	Falcated Duck	<i>Anas falcata</i>
8	Gadwall	<i>Anas strepera</i>
9	Common Teal	<i>Anas crecca</i>
10	Northern Pintail	<i>Anas acuta</i>
11	Tufted Duck	<i>Aythya fuligula</i>
12	Smew	<i>Mergellus albellus</i>

13	Common Merganser	<i>Mergus merganser</i>
14	Common Buzzard	<i>Buteo buteo</i>
15	Upland Buzzard	<i>Buteo hemilasius</i>
16	Rough-legged Buzzard	<i>Buteo lagopus</i>
17	Common Crane	<i>Grus grus</i>
18	Red-crowned Crane	<i>Grus japonensis</i>
19	Water Rail	<i>Rallus aquaticus</i>
20	Great Bustard	<i>Otis tarda</i>
21	Black-tailed Gull	<i>Larus crassirostris</i>
22	Mew Gull	<i>Larus canus</i>
23	Siberian Gull	<i>Larus vegae</i>
24	Yellow-legged Gull	<i>Larus cachinnans</i>
25	Slaty-backed Gull	<i>Larus schistisagus</i>
26	Black-headed Gull	<i>Larus ridibundus</i>

Criterion 5 :

Key areas were observed by route survey, through direct counting method. According to the statistics, there were 257234 waterfowl in 2010, and 80511 in 2011, and 248640 in 2012.

Statistics	2012	2011	2010
Number of geese and ducks	51010	39767	96611
Number of crakes	36854	2316	28625
Number of cranes and storks	4358	2348	4499
Number of shorebirds	75650	3027	60030
Number of Laridae	62662	7194	37807
Number of cormorant	3398	21000	12261
Number of Ardeidae	14708	4859	17401
Total number of waterfowl	248640	80511	257234
Number of waterfowl species	110	78	104

Criterion 6 :

A total of thirty-eight species of waterfowl exceed the 1% criteria of international importance in the Shandong Yellow River Delta Wetland.

No	Species	Number counted	1% level	Year
1	<i>Charadrius alexandrinus</i>	24313	1000	2010
2	<i>Charadrius alexandrinus</i>	420	260	2009
3	<i>Pluvialis squatarola</i>	14899	1000	2011
4	<i>Calidris alpina</i>	24106	10000	2012
5	<i>Calidris tenuirostris</i>	12816	2900	2012
6	<i>Calidris acuminata</i>	2360	1600	2012
7	<i>Limosa lapponica</i>	10678	1500	2012
8	<i>Limosa limosa</i>	7197	1400	2012
9	<i>Numenius adagascariensis</i>	1125	320	2010
10	<i>Numenius arquata</i>	9766	1000	2010
11	<i>Numenius phaeopus</i>	2626	550	2010
12	<i>Numenius minutus</i>	17000	1800	2009
13	<i>Xenus cinerea</i>	1231	500	2012
14	<i>Tringa erythropus</i>	594	250	2011

No	Species	Number counted	1% level	Year
15	<i>Tringa guttifer</i>	15	5	2010
16	<i>Haematopus ostralegus</i>	175	70	2010
17	<i>Himantopus himantopus</i>	1730	1000	2012
18	<i>Tringa incana</i>	262	250	2012
19	<i>Grus leucogeranus</i>	44	35	2012
20	<i>Grus monacha</i>	22	10	2012
21	<i>Grus vipio</i>	119	10	2012
22	<i>Grus japonensis</i>	147	4	2012
23	<i>Grus grus</i>	2000	150	2012
24	<i>Cygnus cygnus</i>	1200	600	2012
25	<i>Cygnus olor</i>	73	15	2012
26	<i>Anser fabalis</i>	3500	100	2011
27	<i>Anas falcata</i>	550	830	2012
28	<i>Anas poecilorhyncha</i>	13500	11300	2012
29	<i>Taborna tadorna</i>	3000	1200	2012
30	<i>Mergus merganser</i>	1620	710	2011
31	<i>Larus saundersi</i>	800	85	2012
32	<i>Sterna hirundo</i>	1370	460	2011
33	<i>Platalea minor</i>	47	20	2009
34	<i>Platalea leucorodia</i>	130	100	2012
35	<i>Ciconia nigra</i>	22	1	2012
36	<i>Ciconia boyciana</i>	380 Migratory birds; 32 pairs of breeding birds	30	2012
37	<i>Phalacrocorax carbo</i>	17000	1000	2011
38	<i>Pelecanus crispus</i>	58	1	2011

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Evergreen sclerophyllous forests, scrubs or woodlands, Oriental Deciduous Forest Biogeographic Province, Palaearctic Realm

b) biogeographic regionalisation scheme (include reference citation):

A Classification of the Biogeographical Provinces of the World (Miklos D.F. Udvardy, 1975)

16. 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.

Geology: The Shandong Yellow River Delta Wetland is located in the China-Korea paleocontinent, west of the Tancheng-Lujiang fault zone, east of the Jiyang depression and south of the Bohai depression, and is primarily controlled by the Neocathaysian structural system and NW trending structures. The wetlands are in the Mesozoic-Cenozoic faulted block-depression basin.

Geomorphology: Mainly consists of terrestrial, intertidal and sub-tidal zones. Terrestrial landforms include battures, micro-inclined flats and depressions; intertidal landforms include high tidal flats and low tidal flats, consisting of shells and debris, sand bars in the river mouth and tidal creeks; subtidal landforms include the subaqueous delta of the current Yellow River estuary and subaqueous cliffs of the abandoned estuaries.

Origins: Naturally originated. The Shandong Yellow River Delta Wetland is formed by the deposition of sediment carried by the Yellow River to the Bohai depression. During the flooding period in 1855, the Yellow River burst at Tongwaxiang of Henan Province, forced its way through the channel of the Daqing River, and flowed from Jinan of Shandong Province to Xiaoshen Temple of Lijin County where it met the Bohai Sea. Due to large amounts of estuarine sediment deposition, the Yellow River extended its reach to the sea by 2.2 km per year, and land accretion in the Yellow River Delta occurred at a rate of 32.4 km² annually. This makes the Yellow River Delta Wetland one of the fastest growing wetlands in the world.

Hydrology: The Yellow River is the dominant factor controlling and maintaining the hydrological characteristic in the Yellow River Delta Wetland. The annual total of fresh water to the wetlands decreased slightly in recent years. Runoff of the Yellow River has strong inter- and intra-annual variations, and often contains large amounts of sediment. The water of the Yellow River is alkaline, with a pH range from 8.0 to 8.3, and total hardness ranging from 2.16 to 5.56 mol/L. The total volume of sediment carried to the river mouth by the Yellow River is 10.49×10⁸t annually.

Soil Type: The soil formation in the Shandong Yellow River Delta Wetland is influenced by a number of different processes including flooding, natural migration of the channel and mouth of the Yellow River, coastline morphological change, and seawater intrusion. Most soils in the region are developed over the last one hundred years. In upper elevations where irrigation is possible, the soils are often alluvial soils with a pH ranging from 7.5 to 7.8 and vulnerable to secondary salinization; in coastal areas where seawater is a direct influence, the soils are often saline with a salt content of > 0.8%. These saline areas are mostly bare parent land salinized by sea invasion, and no biotic soil formation could be observed.

Water quality: The water of the Shandong Yellow River Delta Wetland is quite good. Above-ground water is calescent, light hard, with a pH range of 8.0 to 8.3 and a total hardness of 2.16 to 5.56 mol/L. Total dissolved solids ranges from 0.2 to 0.6 g/L. Below-ground water has lower salinities that are often < 1mg/L.

Water level: Influenced by fresh water received from the Yellow River and micro-topography, the water level varies in different areas, ranging from 0.3m to 1.5m above Yellow Sea level, and influenced by variation in fresh water. Coastal tidal flats are flooded periodically by seawater; during high tides, the water depth is often < +1m above Yellow Sea level. The groundwater level ranges from 1m to 4m.

Tide: Mediated by the M2 amphidromic point (N38.09' E 119.04'), tides in the Shandong Yellow River Delta Wetland are irregularly semi-diurnal. The intervals between high tides in the Yellow River mouth area are on average between 10 and 11 hours, and average tidal ranges of spring and neap tides are 1.06m to 1.78m and 0.46m to 0.78m, respectively.

Climate: The average annual temperature, extreme high temperature and extreme low temperature are 11.9°C, 39.7°C and -19.1°C, respectively. The frost-free period is about 196 days. The average annual precipitation is approximately 592mm. Precipitation has strong inter-annual and seasonal variations, and the average rate of variation is 19%. The average annual evaporation and relative humidity is 1550 mm and 68%, respectively. Main climatic disasters include storm tides, waterlogging and drought.

17. Physical features of the catchment area:

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

The landforms in the catchment area are directly controlled by the modern evolution and migration of the Yellow River mouth. Due to a number of historical migrations, the landforms in this area are complex and diverse. The land surface is covered by Quaternary fluvial and paralic sediments. The landforms are generally alluvial plains with micro reliefs. The wetland soils belong to two main groups: alluvial soil and saline soil primarily composed of clays, silts and fine sands; soft soil layers also occur in some areas. The climate is temperate continental monsoonal, with distinct seasons, sufficient solar radiation and synchronization in temperature and precipitation.

18. Hydrological values:

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

Marshes, ditches, depressions and plain reservoirs in the wetland store large amounts of fresh water, and can efficiently control floods and regulate runoff. Freshwater discharge from the wetlands to the groundwater can suppress seawater intrusion and salinization. Vegetation, such as *Tamarix chinensis*, *Phragmites australis* and *Suaeda salsa*, plays an important role in preventing soil erosion and stabilizing the shoreline.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar “Classification System for Wetland Type” present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va
 Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

Wetland type	Descriptions	Area (ha)	Percentage
A	Permanent shallow marine waters (-3 meter)	33359.4	34.8%
G	Intertidal mud flats	28927.6	30.2%
Tp	Permanent freshwater marshes	11730.5	12.2%
H	Intertidal marshes	8928.1	9.3%
M	Permanent rivers	3333.2	3.5%
L	Permanent inland deltas	2983.8	3.1%
W	Shrub-dominated wetlands	2893.8	3.0%
1	Aquaculture ponds	1518.6	1.6%
F	Estuarine waters	1276.8	1.3%
9	Canals and drainage channels, ditches	653.3	0.7%
3	Irrigated land	268.4	0.3%
5	Salty Ponds	63.6	0.1%
2	Ponds	12.8	<0.1%

20. General ecological features:

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

The wetland is to the east of the Bohai Sea, where the Yellow River flows into the sea. The river and the sea meet and exchange here, with freshwater and salt water blending, forming a variety of habitat types. The ecosystem is almost intact with integrated landscape. With few human disturbances, the ecosystem is maintained in a natural state, which provides an ideal place for the protection of biodiversity. Major habitat types are:

(1) Shallow waters and muddy beach. The coastline of mudflat is 131km long. Due to regular tidal fluctuation and long-term water accumulation, a large number of benthic organisms inhabit in the intertidal zone, and supply food sources for waterfowl. Many birds concentrate here, such as plovers, snipes, herons, gulls, cormorants, geese and ducks and cranes.

(2) Freshwater swamp. Reed swamps are the major land cover type, widely distributed in the Wetland. With integrated landscape and a low degree of fragmentation, less human interference, as well as the effect of microtopography factor, a spatial pattern of different water depth gradients has formed that supports a diversity of bird species, such as cranes, storks, geese and ducks, gulls, terns, grebes, crakes, cormorants, plovers, snipes and herons.

(3) Estuarine waters, delta and permanent rivers, including the Diaokou River, canals, Xiaodao Rivers and other rivers flow into the sea, besides Yellow River. These rivers are abundant with fish, shrimp and other aquatic animals, with flourish float grass and hygrophytes. The estuarine area is a place for exchanging substance and energy with high biological productivity. The main bird species in these habitats are geese and ducks, gulls, terns, plovers, snipes, herons and cranes, etc.

(4) Aquaculture farms, irrigated land, drains, ponds and other artificial wetlands. These wetlands storing fresh water resources to meet the need of industry, agriculture and human consumption. With great area, these wetlands are rich in fish and shrimp, and attract swans, ducks, grebes, herons and gulls and other waterfowl to forage in this habitat.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) 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 RIS.*

Plants of compositae, gramineae, leguminosae and are most common in the Wetland. The typical plants include *Suaeda salsa*, *Atriplex centralasiatica*, *Aeluropus sinensis*, *Setaria viridis*, *Imperata cylindrical*, *Phragmites australis*, *Artemisia capillaris* etc. There are a total of 393 plant species (including varieties) in the Shandong Yellow River Delta Wetland, which belong to 183 genera and 59 families. Among these species, 116 phytoplankton species of 4 phyla, 4 ferns of 3 families and 3 genera, 2 gymnosperms species of 2 families and 2 genera, 271 angiosperms of 54 families and 178 genera (including 87 monocots species of 11 families and 57 genera and 184 dicotyledons species of 43 families and 121 genera). *Glycine soja*, a national 2nd level protection species in China is recorded here. The wetland is the largest natural beach vegetation area in China, with vegetation coverage of 55.1%. Most vegetation here is natural. Main woody plants are *Robinia pseudoacacia*, *Salix matsudana* and *Tamarix chinensis*.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

There are 197 fish species belonging to 55 families and 16 orders, 26 mammal species belonging to 14 families and 7 orders, 6 amphibian species belonging to 3 families, and 10 reptile species belonging to 6 families. Among these, there are three species of Chinese national key-protected fish,

such as *Acipenser dabryanus*, *Psephurus gladius*, *Trachidermus fasciatus*; there is one species of national key-protected reptiles *Dermochelys coriacea* and one species of key-protected terrestrial mammals *Felis bengalensis*; and there are five species of marine animals such as *Phoca vitulina*, *Balaenoptera acutorostrata*, *Neophocaena phocaenoides*, *Tursiops truncatus*, *Pseudorca crassidens*. There are 367 bird species belonging to 64 families and 19 orders, which include 136 species of waterfowl belonging to 20 families and 9 orders. The Shandong Yellow River Delta Wetland is one of two wintering sites for *Grus japonensis*, with 52 wintering individuals recorded in 2008, 35 recorded in 2010 and 27 recorded in 2012. It is also the largest migratory stopover for *Pelecanus crispus*, with a population of 40 individuals in 2009 and 58 individuals in 2012.

Besides the rare species listed in Criteria 2, 20 species listed in the 2nd level of national protection species of China, including *Anser albifrons*, *Glaucidium cuculoides*, *Pelecanus philippensis*, *Tyto longimembris*, *Accipiter soloensis*, *Buteo hemilasius*, *Cygnus cygnus*, *Pernis ptilorhynchus*, *Phalacrocorax pelagicus*, *Aegyptius monachus*, *Numerius minutus*, *Cygnus columbianus*, *Ninox scutulata*, *Cygnus olor*, *Aix galericulata*, *Asio otus*, *Athene noctua*, *Elanus caeruleus*, *Otus bakkamoena* and *Accipiter nisus*.

23. Social and cultural values:

a) Describe if the site has any general social 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:

(1) Material production. The Shandong Yellow River Delta Wetland is rich in wetland resources. As an important production material for the paper industry, agriculture, aquaculture and weaving industry, reed is extensively distributed and highly productive. The site also produces botanicals, food resources and crude salt, which have great market value.

(2) Eco-tourism. The Shandong Yellow River Delta Wetland was named as one of the six most beautiful wetlands in China by Chinese National Geography magazine in 2005. The vegetation, wild animal, topology, water, and sky is characterized as 'unique', 'unusual', 'vast', 'wild' and 'brand new'. Unique topography, landforms and natural conditions have created a diversity of landscapes and wetland types for tourism. As a meeting site for river and sea, a newly born wetland and a heaven for birds, the Wetland is an ideal place for tourism, wetland experience and scientific education.

(3) Scientific research. The Shandong Yellow River Delta Wetland is not only an important base for studying the estuarine ecosystems and their internal biological formation, development and succession, but has great meanings for the structure, function, development and succession of ecosystems. Many colleges, universities and research institutions have established educational, research and monitoring bases here.

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?

No.

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:

24. Land tenure/ownership:

- a) within the Ramsar site:

All land in the wetland is state-owned and is managed by the Yellow River Delta National Nature Reserve Authority.

- b) in the surrounding area:

State ownership. The land is tenured to local government.

25. Current land (including water) use:

- a) within the Ramsar site:

The total area of Shandong Yellow River Delta Wetland is 95949.9 hectares , all the land is protected area. The wetland ecosystem and biodiversity is almost intact. It is the distribution center of birds in the Reserve. Human activities are strictly restricted.

- b) in the surroundings/catchment:

In the surroundings of the site there are farmlands, forestlands, aquaculture pools, oilfields and salt fields. Local residents go fishing in the coastal area.

26. 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 Ramsar site:

The Yellow River flow reduction and wetland degradation. The Yellow River is an important water source for the wetland, a determining factor in forming and maintaining basic attributes of the wetland, and supporting the site's ecological and biodiversity characteristics. Since 1996, precipitation in the Yellow River Basin has decreased due to the ecological and environmental deterioration. Water consumption from the upper reaches of the Yellow River has increased sharply. Especially water use from industry and agriculture and development of irrigation from the Yellow River made the Yellow River runoff reduced drastically, even cut off. In recent years, flow from the Yellow River has reduced, resulting in wetland degradation.

- b) in the surrounding area:

Farming, aquaculture and oilfield developments impact the wetland ecosystem. In future, tourism development may impact the wetland if not properly managed.

27. Conservation measures taken:

- a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar 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.

The wetland forms the largest part of the Shandong Yellow River Delta National Nature Reserve. The area of the wetland accounts for 57.8% of Nature Reserve, including the total core zone, buffer zone and a small section of experimental zone.

The Nature Reserve was approved by the Chinese State Council in October 1992, and in 1996 it was approved as part of the East Asian-Australasian Flyway waterfowl protection network.

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

Ia ; Ib ; II ; III ; IV ; V ; VI

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

The Master Plan for the Shandong Yellow River Delta National Nature Reserve was approved by the State Forestry Administration in 2011. The management plan is still to be made.

d) Describe any other current management practices:

(1) Establishment of scientific management institution. (i) According to the approved functions of the nature reserve, thirteen departments have been established. (ii) To improve coordination system and community co-management mechanism, a Nature Reserve Management Committee has been established, with the executive vice mayor of Dongying City as director of the Committee, and membership of leaders of relevant departments. The role of the Committee is to coordinate and handle major issues in protection and management work.

(2) Strengthen management through legal mechanisms. 'Interim management measures of Shandong Yellow River Delta National Nature Reserve' has been enacted as a mayor order. According to the 'Notice on the approving the functional area adjustment of Shandong Yellow River Delta National Nature Reserve' by State Council, the demarcation of the Reserve has been finished and the reserve boundary is legally safeguarded. Law enforcement, inspection and patrol teams have been established to maintain the management order.

(3) Scientific research. Long-term monitoring of wetland resources is under taken to understand resource dynamic pattern. Field monitoring, scientific research and education bases have been established with different colleges, universities and research institutions. A number of research projects are being carried out, collaborating with international organizations.

(4) Popular science education. A Yellow River Estuary Wetland Museum has been built for popular science education. A bird-watching association has been established to organize bird watching activities. The Nature Reserve cooperates with environmental organizations and media, to organize scientific investigation, bird watching, photography and other activities. All these activities are reported in various media.

28. Conservation measures proposed but not yet implemented:

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

The proposed Ecosystem Management Plan for Shandong Yellow River Delta Wetland is under preparation.

29. Current scientific research and facilities:

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

Research projects:

National Sci-Tech Support Plan Project: Comprehensive Improvement Technologies and Modes for the Yellow River Delta Ecosystems (2008-2011)

National Natural Science Foundation of China Project: Water Level Modelling of the Wetland Restoration Area in the Yellow River Delta and Its Implications for Ecological Water Compensation (2011-2013)

National Natural Science Foundation of China Project: Thresholds of Ecological Water Requirement of the Yellow River Estuary (2008-2010)

National Natural Science Foundation of China Project: Nitrogen Mineralization and Driven Mechanisms by Water and Salinity in the Yellow River Delta Wetlands (2012-2015)

National Natural Science Foundation of China Project: Modelling the Processes of Estuarine Ecological Water Requirement for Securing System Balances (2013-2016)

Science and Technology Development Project of Shangdong Province: Technology Demonstration of Conservation and Restoration of Coastal Wetlands in the Yellow River Delta (2008-2011).

Facilities:

Ultraviolet spectrophotometer, leaf area meter, Li-6400 portable photosynthesis system, water quality analyzer, multi-parameter hydrological gauge system, algal online monitor, sap flow system, root scanner, photosynthesis monitor.

30. 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.

In November 2004, we established the Dongying Birding Association; many birdwatchers, environmentalists and bird photography enthusiasts have joined the Association. So far, the Association has 220 individual members and 13 organization members. We have organized birding summer camps, campus birding and field birding groups for primary school students, held wild bird photography contests, distributed promotional brochures of 'Common Birds in the Yellow River Estuary', and participated in the nationals survey of coastal waterbirds.

In 2005, we invested 12 million RMB to build the Yellow River Estuary Wetlands Museum. A series of popular science education activities are held periodically during Bird-Loving Week, Wildlife Protection Dissemination Month, World Wetlands Day, etc.

Since 2007, we invested 670 million RMB and progressively established a series of tourism infrastructures including Wetland Park, tourist service center, bird popular science park, birding base, footpaths in natural swamps, wetland restoration area, etc. to facilitate the development of wetland ecological tourism.

We collaborated with various non-governmental organizations including China Wildlife Conservation Association, Friends of Nature, Sohu.com, and World Wide Fund for Nature, and conducted a series of birding and popular science education activities, such as "Come to the wetlands, and experience bird-watching", and "The natural habitats of Oriental White Stork expedition".

In 2010, we held the 1st China Yellow River Estuary International Birding Festival, and 24 teams from 13 provinces of China participated in the bird-watching contest.

In 2011, with the theme of "Come to the Yellow River Delta wetlands", we organized 19 large photos arranged in 10 display boards to introduce the wetlands, ecology and bird resources in the Yellow River Delta in subways in Beijing, during the Beijing Subway Ecological Exhibition for the Public held by China State Forestry Administration and Beijing Subway Operation, Ltd.

31. Current recreation and tourism:

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

Ecological tourism has been carried on at the site since 2005, with approximately 200,000 visitors annually.

32. Jurisdiction:

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

Regional: Dongying Municipal Government, Shandong Province Functional
Functional: Forestry Department of Shandong Province.

33. 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. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Definition: Shangdong Yellow River Delta National Nature Reserve Management Bureau
General Director: Jiajing Song, Director
Address: No. 258, Yihe Road, Dongying City, Shangdong Province
Postcode: 257091
Tel: +86-546-8305259 Fax: +86-546-8305827
Email : bhqkyz@126.com

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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