ASIA / PACIFIC

MIGRATORY BIRD SANCTUARIES ALONG THE COAST OF YELLOW SEA-BOHAI GULF OF CHINA (PHASE I)

CHINA

Spoon-billed Sandpiper (*Calidris pygmaea*) habitat, Tiaozini © IUCN / Sonali Ghosh

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

MIGRATORY BIRD SANCTUARIES ALONG THE COAST OF YELLOW SEA-BOHAI-GULF OF CHINA (PHASE I) (CHINA) – ID N° 1606

IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE: To defer the nominated property under natural criteria.

Key paragraphs of Operational Guidelines:
Paragraph 77: Nominated property has potential to meet World Heritage criteria.
Paragraph 78: Nominated property does not currently meet integrity, protection and management requirements.

1. DOCUMENTATION

a) Date nomination received by IUCN: 25 March 2018.

b) Additional information officially requested from and provided by the State Party: Following the IUCN World Heritage Panel a progress report was sent to the State Party on 20 December 2018. This letter advised on the status of the evaluation process and sought responses/clarifications on a range of issues including the assessment of the relative significance of the values represented in the nominated property in relation to the value of the potential 14 components remaining to be nominated in the future; the status, plans and timelines which are anticipated for nominating the remaining components of the series; and the commitment of the State Party to include Tiaozini as part of this Phase I nomination. IUCN met with representatives from the nominated property on 14 February 2019 in order to engage in a dialogue on the nomination and clarify requests for additional information. The State Party submitted additional information on 22 February 2019.

c) Additional literature consulted: Various sources, including: Crockford, N.J., Millington, S. & Provencher, J. (2018). Challenges and opportunities for transboundary conservation of migratory birds in the East Asian Australasian Flyway. Conservation Biology 32(3):740-743; He, Z., Xu, S., Shen, W., Long, R. & Yang, H. (2016). Overview of the development of the Chinese Jiangsu coastal wind-power industry cluster. Renewable and Sustainable Energy Reviews 57:59–71; Li, J., Wang, Y. & Zhang, R. (2007). Influence of seawall line choice on tide lock drainage in tidal flat inning. Cangdongpian Inning Area on the west part of Tiaozini Sand as a case study. Marine Science Bulletin 9(1):55-65; Liu, Y., Li, M., Zhou, M., Yang, K. & Mao, L. (2013). Quantitative analysis of the waterline method for topographical mapping of tidal flats: A case study in the Dongsha Sandbank, China. Remote Sensing 5(11):6138-6158; MacKinnon, J., Verkuil, Y.I. & Murray, N. (2012). IUCN situation analysis on East and Southeast Asian intertidal habitats, with particular reference to the Yellow Sea (including the Bohai Sea). Occasional Paper No 47 of the IUCN Species Survival Commission; Melville, D.S., Chen, Y. & Ma, Z. (2016). Shorebirds along the Yellow Sea coast of China face an uncertain future - a review of threats. Emu-Austral Ornithology 116(2):100-110; Menxiu, T., Lin, Z., Li, J., Zöckler, C. & Clark, N.A. (2012). The critical importance of the Rudong mudflats, Jiangsu Province, China in the annual cycle of the Spoon-billed Sandpiper *Calidris pygmeus*. Wader Study Group Bulletin 119(3):208-212; Murray, N.J., Ma, Z. & Fuller, R.A. (2015). Tidal flats of the Yellow Sea: A review of ecosystem status and anthropogenic threats. Austral Ecology 40:472-481; Paulson Institute (2016). Blueprint of Coastal Wetland Conservation and Management in China. Institute of Geographic Sciences and Natural Resources Research, CAS; Peng, H-B. et al. (2017). The intertidal wetlands of southern Jiangsu Province, China – globally important for Spoon-billed Sandpipers and other threatened waterbirds, but facing multiple serious threats. Bird Conservation International 27:305-322; Piersma, T. et al. (2017). Loss of habitat leads to loss of birds: reflections on the Jiangsu, China, coastal development plans. Wader Study 124(2):93-98; Rogers, D.I. et al. (2010). Red Knots (*Calidris canutus piersmai* and *C. c. rogersi*) depend on a small threatened staging area in Bohai Bay, China. Emu-Austral Ornithology 110(4):307-315; Studds, C.E. et al. (2017). Rapid population decline in migratory shorebirds relying on Yellow Sea tidal mudflats as stopover sites. Nature Communications 8:14895.

d) Consultations: 11 desk reviews received. The mission met with a wide range of stakeholders including State Party representatives ranging from central to local governmental levels, academia, NGOs, and local community representatives. Additional consultations were held with selected international experts.

e) Field Visit: Sonali Ghosh and Tilman Jaeger, 14-19 October 2018

f) Date of IUCN approval of this report: May 2019

2. SUMMARY OF NATURAL VALUES

Located between China and the Korean Peninsula, the Yellow Sea is the northern part of the East China Sea, a marginal sea of the Pacific Ocean. The Bohai Gulf forms the innermost gulf of the Yellow Sea. The Bohai Gulf is markedly distinct from the Yellow Sea and therefore often considered to constitute a separate marine region rather than an appendix to the Yellow Sea. The particularities of the Bohai Gulf will not be discussed in any detail in this report because the two components in the Phase I nomination are not located in the Bohai Gulf. Several components suggested for nomination in planned Phase II are located in the Bohai Gulf.

The Yellow Sea is a semi-enclosed sea connected to the Bohai Gulf and to the East China Sea through a permanent circulation system. Conventionally, the southern border of the Yellow Sea is defined as an imagined line between the north bank of the mouth of the Yangtze River (Changjiang, China) to the south side of Jeju Island (Republic of Korea). The average depth of the Yellow Sea is little more than 40m and most of it is shallower than 80m. Further characteristics include (a) exceptionally large river sediment loads, including loads from the mighty Yellow and Yangtze Rivers; these sediments give the sea its colour – and its name (in addition to important eolian sediments which likewise contribute to the turbid yellowish colouring); (b) strong effects of rivers on salinity; (c) marked seasonal variations; (d) coastal ice-formation in the winter; and (e) strong effects of the monsoon regime.

The nominated property, 'Migratory Bird Sanctuaries along the Coast of Yellow Sea-Bohai Gulf of China', is proposed as a serial nomination of 16 components. The nomination dossier proposed initially three phases, however, this was revised to two phases by the State Party in its additional information submitted 22 February 2019, with two components nominated in Phase I. These constitute the nomination evaluated herein and include the Jiangsu Dafeng National Nature Reserve, and the southern section and Dongsha Experimental Zone of Jiangsu Yancheng National Nature Reserve (144,839ha) and the middle section of Jiangsu Yancheng National Nature Reserve (43,804ha), denominated as YS-1 and YS-2, respectively. In its February submission, the State Party also indicated the inclusion of the Tiaozini area (an additional 35,469ha included in YS-1) as part of the Phase I nomination and indicated its plans to submit the nomination files for Phase II before February, 2022. The total area nominated in two components is thus 188,643ha with a buffer zone of 80,056ha. Table 1 below details the nominated components in Phase I (YS-1, YS-2) highlighted within the overall 16 component phased approach.

No.	Identification	Nominated	Buffer (~)	Total (ha.)
1	Dandong Yalu River Estuary National Nature Reserve, Liaoning	36,000	45,430	81,430
2	Changhai Provincial Nature Reserve for Rare Marine Life, Liaoning	2,000	0	2,000
3	Snake Island-Laotie Mountain National Nature Reserve, Liaoning	5,512	3,560	9,072
4	Dalian Haibin-Lüshunkou National Park, Liaoning	12,103	16,670	28,773
5	Liaohe River Estuary National Nature Reserve, Liaoning	47,913	32,087	80,000
6	Shi River Estuary, Shanhaiguan, Qinhuangdao, Hebei	127	0	127
7	Beidaihe-Geziwo/Xin River Estuary, Hebei	7,887	0	7,887
8	Golden Coast Nature Reserve, Beidaihe New District, Hebei	25,213	3,801	29,014
9	Luannan-Zuidong Coastal Wetland, Hebei	6,806	4,219	11,025
10	Caofeidian Wetland, Hebei	5,007	5,074	10,081
11	Nandagang Wetland in Cangzhou, Hebei	4,603	2,897	7,500
12	Yellow River Delta National Nature Reserve, Shandong	70,652	81,338	151,990
13	Jiangsu Dafeng National Nature Reserve, and the southern section and Dongsha Experimental zone of Jiangsu Yancheng National Nature Reserve, as well as the Tiaozini area (YS-1)	144,839	28,271	173,110
14	The middle section of Jiangsu Yancheng National Nature Reserve (YS-2)	43,804	51,785	95,589
15	Dongtai-Rudong Coast, Jiangsu	21,548	0	21,548
16	Qidong Yangtze River Estuary Nature Reserve, Jiangsu	14,959	5,259	20,218
Total area (ha.)		448,973	280,391	729,364
Total area, Phase I		188,643	80,056	268,699
Total area, Phase II		260,330	200,335	460,665

Table 1: Components of proposed Migratory Bird Sanctuaries along the Coast of Yellow Sea-Bohai Gulf of China (Phases I and II). Components nominated under Phase I (YS-1, YS-2) are highlighted. YS-1 includes the Tiaozini area, added to the nomination in February 2019. Sources: Adapted from Supplementary Information submitted by the State Party.

The current nomination of two components (denominated as YS-1 and YS-2) is a modest representation of a vast and complex overall system. The State Party has made a significant decision to expand YS-1 to include well-documented habitats of critical importance for bird conservation, namely the Tiaozini area adjacent to and just of south of YS-1 and likewise located in Jiangsu Province.

The Yellow Sea (and the Bohai Gulf) boasts enormous tidal mudflats due to the combination of shallow water depth, gentle slopes, wide tidal range, marine currents and the above-mentioned large river systems permanently discharging vast amounts of sediments (Yellow River, Yangtze River, Yalu River, Liao River, Luan River, Hai River etc.). The intertidal mudflat system is often referred to as the world's largest. The boundaries of YS-1 are mainly determined according to the typical vegetation zones in this area, as well as the marine and terrestrial habitat types, such as intertidal mudflats and radial sand ridges. The main part of this area is within the range of Jiangsu Dafeng National Nature Reserve and Jiangsu Yancheng National Nature Reserve. In terms of naturalness and intactness, the nominated areas are challenged due to the enormous pressures on the system. The overall ecosystem has lost much of its integrity due to the massive transformation, and partial destruction, of much of the coast of the Yellow Sea. The nominated areas continue to underpin the viability of the central hub of one of the world's most important and arguably the world's most fragile flyway, however, it is clear that larger areas and phased regional serial expansion would increase the integrity, as would coastal restoration efforts.

The intertidal mudflats, marshes and shallow waters are exceptionally productive and provide spawning and nursery habitat for many fish and crustacean species, and as such are critically important for local livelihoods, including coastal and off-shore fisheries. They are also home to a high diversity of species from phytoplankton to marine mammals. The nomination dossier documents the use of the nominated property by 680 species of vertebrates, including 415 species of birds, 26 species of mammals, 9 species of amphibians, 14 species of reptiles, 216 species of fish, as well as 165 species of zoobenthos. Large aggregations of birds depend on the coast as a stop-over, moulting, staging, wintering, foraging or breeding grounds. The intertidal mudflats, in particular, attract a high diversity and enormous numbers of resident and migratory birds.

The global importance of the wider area is illustrated in the designation of several Ramsar sites (Shuangtai Estuary, Dalian National Spotted Seal Nature Reserve, Shandong Yellow River Delta Wetland, Chongming Dongtan Nature Reserve / Shanghai, Dafeng National Nature Reserve, Shanghai Yangtze Estuarine Wetland Nature Reserve for Chinese Sturgeon), some of which fully or partially overlap with components of both proposed phases.

From a global conservation perspective, probably the most striking and visible conservation value of the intertidal and coastal systems is their major importance as an irreplaceable hub of the East Asia-Australasia Flyway (EAAF) (even though these depend on, and cannot be separated from, countless other features of the coastal-marine system and linked river systems). A wealth of literature leaves no doubt that the Yellow Sea and the Bohai Gulf play an indispensable role in the EAAF, a flyway linking bird populations of at least 21 countries. The literature similarly leaves no doubt that the EAAF is among the most threatened worldwide and boasts the largest number of Endangered and, in some cases, Critically Endangered species.

The property supports seventeen IUCN Red List species: one Critically Endangered (Spoon-billed Sandpiper, *Eurynorhynchus pygmeus*); five Endangered *(*Black-faced Spoonbill, *Platalea minor;* Oriental Stork, *Ciconia boyciana;* Red-crowned Crane, *Grus japonensis;* Nordmann's Greenshank, *Tringa guttifer;* Great Knot, *Calidris tenuirostris);* five Vulnerable *(*Chinese Eegret, *Egretta eulophotes;* Dalmatian Pelican, *Pelecanus crispus;* Swan Goose, *Anser cygnoides;* Relict Gull, *Larus relictus,* Saunder's Gull, *Larus saundersi*) and several Near Threatened *(*Red Knot, *Calidris canutus;* Asian Dowitcher, *Limnodromus semipalmatus;* Black-tailed Godwit*, Limosa limosa;* Eurasian Curlew*, Numenius arquata;* Bar-tailed Godwit, *Limosa lapponica; Reed Parrotbill (Paradoxornis heudei);* Curlew Sandpiper, *Calidris ferruginea;* Greater Sand Plover, *Charadrius leschenaultia;* Lesser Sand Plover, *Charadrius mongolus;* Ruddy Turnstone, *Arenaria interpres).*

According to the literature and expert input, three species in particular are believed to depend on the nominated areas, and areas adjacent to them, for their survival. These are Spoon-billed Sandpiper, Nordmann's Greenshank, Great Knot and the Far Eastern Curlew (*Numenius madagascariensis*). The Critically Endangered Chinese Crested-Tern (*Thalasseus bernsteini*) likewise critically depends on the coastal-marine system. While the status of the latter species does not appear to depend on the currently nominated area, Phase II components would add a layer of protection to key habitat needed to prevent imminent extinction of this species in the wild.

The two nominated Phase I components are among the largest in the proposed overall serial property and have consistently emerged as key areas in several priority-setting exercises (e.g. Bai et al. 2015; Bamford et al. 2008; MacKinnon et al. 2012; Menxiu et al. 2012; Paulson Institute, 2016; Peng et al. 2017; Xia et al. 2017).

3. COMPARISONS WITH OTHER AREAS

The nomination dossier highlights comparison with other coastal natural World Heritage properties or candidate

sites along the EAAF. It is argued that at present the Yellow Sea ecoregion does not have any coastal natural World Heritage properties and that the nomination would thus contribute to filling a gap. Comparison with inland World Heritage properties or candidate sites along the EAAF and featuring wetlands are likewise presented.

The nominated property is compared to the Wadden Sea, a World Heritage property sharing several similarities. Comparable to the Yellow Sea, the Wadden Sea, shared by three countries (Denmark, Germany and the Netherlands), is likewise a large intertidal ecosystem. Both areas are critically important, integral parts of major bird migration flyways under high and multiple development pressures. The case for the nominated property's OUV overwhelmingly emphasizes the importance of the region within a major flyway (key stopovers, wintering areas and breeding grounds, etc.). The particularities of the regional coastal-marine ecosystem are highlighted which set it apart from other seemingly similar coastal-marine areas, including the Wadden Sea.

IUCN, in collaboration with UN Environment WCMC, has undertaken additional comparative analysis. With respect to criterion (ix), the nominated property is found in the largest intertidal wetland in the world, which is one of the most biologically diverse. It is located in the Yellow Sea Saline Meadow terrestrial ecoregion and the Yellow Sea marine ecoregion, which are not yet represented on the World Heritage List. It is also found in a marine priority ecoregion (Yellow Sea), which by contrast is already well represented.

The site is found in the middle section of the EAAF, which is of global importance for migratory bird species. The Yancheng Wetlands, which are part of the property, are considered by several international conservation organisations as the most important migratory bird habitat along the Bohai Gulf-Yellow Sea coast, supporting a high number of migratory species, including threatened species that use the site for wintering, breeding or stop-overs on the EAAF. For example, the EAAF Partnership has ranked Jiangsu Yancheng National Nature Reserves (YS-2) as being among the top three of 1,030 key wetlands assessed in terms of bird species diversity.

The nominated property is not found in a biogeographical unit that has been mentioned as a gap on the World Heritage List and does not overlap with any protected area considered to be amongst the most irreplaceable. However, it overlaps with Yangcheng Nature Reserve, which is also an IBA, and considered globally significant.

The additional IUCN and WCMC analysis concludes quite clearly that the biodiversity that characterises this region is of global significance, based on spatial analysis and literature review, especially with regard to criterion (x). The globally significant values of the intertidal mudflats, marshes and shallow waters of the overall Yellow Sea (and the Bohai Gulf) are well established through the body of scientific literature which exists for this part of the EAAF. These ecosystems and habitats are therefore critical to the viability of one of the planet's most important bird migratory pathways.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1. Protection

The Phase I components are all state-owned and fully protected by law. Recent policy changes are supportive of coastal conservation viz "Ecological Red Lines" which the nomination notes have been designated by the Government of China, constituting a major part in the 35% natural coastline that the government has proposed to retain.

Resource use and, in the coastal areas, access are severely restricted. Some fishing and harvesting rights are allocated to local resource users in shallow near-shore waters, including mudflats. It appears that most tourism is physically separated from the actual protected areas and is limited to visitor centres and a fenced area for breeding of the Milu Deer (*Elaphurus davidianus,* EX), a culturally important species subject to efforts to eventually re-establish this species in the wild.

YS-1 and YS-2 have the protection status of National Nature Reserves (with the exception of the Tiaozini area). In addition, all public facilities and infrastructure are publicly owned and the control of natural resources is similarly publicly administered. Many national and provincial laws and regulations protect the nominated property. These include the Constitution of the People's Republic of China, the Environmental Protection Law, the Forest Law, the Marine Environment Protection Law and the Regulations on Nature Reserves, Regulations of Jiangsu Province on Wetland Protection and Tourism, etc.

The Tiaozini area, a significant area of 35,469ha recently included in YS-1, comprises several different wetland parks and reserves, all protected by wetland regulations of 2013 and destined to become consolidated into Yancheng National Nature Reserve. IUCN notes, in the case of Tiaozini, this would effectively reverse an earlier excision from this protected area which enabled the land reclamation to take place. After the adjustment, there are five existing protected areas located in the current Phase I nomination which are Jiangsu Dafeng National Nature Reserve, Jiangsu Yancheng National Nature Reserve, Jiangsu Yancheng Tiaozini Municipal Wetland Park, Jiangsu Dongtai Gaoni Wetland Nature Reserve Plots and Jiangsu Dongtai Tiaozini Wetland Nature Reserve Plots.

The State Party has confirmed in its supplementary information that all reclamations in the area have been halted.

IUCN notes significant concerns regarding system level coordination and management which are elaborated under sections 4.3 (Management) and 5.1 (Serial property considerations) and which call into question how a fully phased serial property would be adequately protected.

IUCN considers that the protection status of the nominated property does not meet the requirements of the Operational Guidelines.

4.2 Boundaries

The size and diversity of the YS-1 and YS-2 nominated component areas, when compared to the scale and diversity of the overall Yellow Sea ecosystem, is limited given the complexity of this system. It is not clear that the boundaries of these two components can and do incorporate all the attributes contributing to OUV, especially for migratory species.

The two components of the nominated property include clear boundaries for adequate protection of birds when they are on-site. However, the nomination of Phase I has not demonstrated that the overall site configuration passes the tests of completeness and how this configuration provides for habitat linkage and supports ecological function. For example, more consideration of the linkages between the supratidal coast and the intertidal system would be desirable. Furthermore, a better understanding is needed of the resilience of the property to environmental stresses and threats, given the intense pressures for land reclamation and development on this coastline.

The State Party provided additional information on the components proposed to complete this serial property. However, IUCN understands that precise boundaries for the full suite of components are still being finalized and details of these were therefore not provided in the dossier. IUCN, considers that this level of detail is required for a serial site nomination in order to critically assess OUV, in particular the complementarity and co-dependence of component attributes.

Buffer zones have been clearly demarcated on the coast side of the two component parts of the nominated property. The buffer zones are under the protection of Yancheng National Nature Reserve and Jiangsu Dafeng National Nature Reserve. These areas are managed according to the regulations of National Nature Reserves. However, buffer zones do not exist for the eastern (marine) side of either of the components. The rationale for the lack of these buffer zones being that access is limited to boats due to sea currents.

IUCN concludes that the boundaries, as currently designed, have not yet made the case as to completeness in terms of attributes contributing to OUV or how this configuration will ensure viable habitat linkages and ecosystem function. Furthermore, how ecological connectivity will be supported, so as to ensure the property is resilient to stresses and threats, has not been proven.

IUCN considers that the boundaries of the nominated property do not meet the requirements of the Operational Guidelines.

4.3 Management

The nominated property is subject to a comprehensive array of planning instruments applying to provincial and municipal level development plans, and marine-terrestrial-, and individual protected areas. The planning documents that support governance and management in the nominated property include 5-year economic and social development plans at municipal and provincial levels; a biodiversity conservation strategy; an integrated water resources plan; and several ecological red line protected plans at provincial level. The nominated component areas have prepared a 'Master Plan of Yancheng National Nature Reserve (2008-2020)'; a 'Yancheng Wetland National Reserve Five Years Construction Management Plan in Jiangsu (2012-2017)'; and a 'Master Plan of Jiangsu Dafeng National Nature Reserve (2013-2022)'.

The World Heritage Application and Management Office was established in the Yancheng Municipal People's Government to coordinate the nomination. On-site management continues with the management authorities of the two National Nature Reserves, wherein a unit responsible for the nomination has been established. According to the dossier, it is foreseen that in case of an inscription the nomination unit will be converted into a heritage management organization.

Law enforcement is reported as effective on land and sea. There are 185 full-time staff in the nominated property (85 in Jiangsu Dafeng National Nature Reserve, and 100 in Jiangsu Yancheng National Nature Reserve, with an additional 15 staff in the Tiaozini wetland management office) in charge of patrol, law enforcement, research, monitoring, tourism and education.

Important and ongoing research has been undertaken in the nominated areas in collaboration with academic institutions on a wide range of relevant topics, including impact assessment of ecological service functions of wetlands, research and prediction of sedimentation and coastline variations in Jiangsu. Monitoring takes place with leading roles for numerous academic institutions from within China and internationally. The EAAF Partnership provides an effective umbrella structure to support coordinated research and monitoring.

Monitoring stations are well equipped with boats, vehicles including SUV and motorcycles, unmanned aerial vehicles, telescopes, GPS, law enforcement recorders, radar stations etc. The daily monitoring of selected mammal and bird species utilises the latest technology.

Financial investment by the authorities is increasing year by year, according to data in the dossier (see Table 2).

Year	Jiangsu Yancheng NNR	Jiangsu Dafeng NNR	Total
2012	5,415,900 *(ca.800,523)*	703,300 *(ca.104,000)*	6,119,200 *(ca.904,700)*
2013	5,776,110 *(ca.853,800)*	893,300 *(ca.132,000)*	6,669,400 *(ca.985,800)*
2014	6,167,800 *(ca.911,700)*	2,022,400 *(ca.298,900)*	8,190,200 *(ca.1,210,600)*
2015	6,428,500 *(ca.950,300)*	2,085,300 *(ca.308,300)*	8,513,800 *(ca.1,258,600)*
2016	6,845,400 *(ca.1,258,600)*	2,294,000 *(ca.339,100)*	9,139,400 *(ca.1,351,000)*

Table 2: Provincial funding by unit per year in RMB Yuan (*USD*). Source: nomination dossier

Management of components YS-1 and YS-2 should not be considered in isolation. The efforts to better conserve, manage and restore the conservation values of the Yellow Sea and Bohai Gulf, particularly for migratory species, has obvious dimensions for transboundary and interregional cooperation. The dossier does not discuss transboundary management, nor coordination among Phase I and Phase II properties, which will be crucial to coordinate and harmonise management across the full serial property. What is needed is a more comprehensive approach at the system level bridging jurisdictions and sectors so as to eventually develop a functional protected area network within the Chinese jurisdiction with a vision of an eventual trans-national approach. Both the coordination within China and the international coordination are in its infancy and thus insufficient.

IUCN considers that the management of the nominated property does not meet the requirements of the Operational Guidelines.

4.4 Community

A potential World Heritage inscription would likely not result in any change in existing community participation and rights. Access to natural resources is already restricted as a function of the nature reserves and would not change were the site to be inscribed. The field evaluation mission was unable to detect tangible evidence of a meaningful role of local communities in decision-making. This view is backed up by references such as the GEF/ADB Management Effectiveness Evaluation Tracking Tool for China's Wetland Protection System which concludes that local communities residing nearby identified a priority for increased consultation related to nature reserve management particularly involving crop damage and impacts on fisheries (geese on rice, herons, cormorants impacting fisheries etc.). Efforts should be directed to improving the engagement of local people in decision making to foster a sense of stewardship of the nominated property.

4.5 Threats

The nominated area has been strongly affected, directly and indirectly, by past and ongoing development both on land and in the sea. Recent policy shifts, advocacy, scientific evidence and international cooperation give rise to hope that the area's global importance can be maintained and eventually even be consolidated. However, much of the challenge must be understood and framed as a restoration effort. The dramatic transformation of the Chinese part of the coast of the Yellow Sea and the Bohai Gulf over the last decades is likely to be among the most drastic examples of rapid coastal transformation anywhere in the world. A 2012 IUCN resolution states that the region is subject to an "unprecedentedly rapid rate of conversion of intertidal wetlands to other forms of land use in the EAAF (faster than the rate of tropical forest loss), thus generating an urgent need for specific research and cooperation for the restoration and management of these habitats".

The literature consistently singles out habitat loss due to large-scale land reclamation, i.e. conversion of coastal, shallow sea and intertidal areas to claim land for human use, in particular industrial projects, farming, aquaculture, industry, leisure and wind power development. The IUCN-facilitated Working Group for the Conservation of the Yellow/West Sea Intertidal and Associated Coastal Wetlands estimates that two-thirds of intertidal wetlands in the Yellow Sea have been lost in the past 50 years. This is in line with several comprehensive studies.

Onshore and offshore wind power development is ubiquitous. The area is characterised by heavy marine traffic from and to major ports, creating some of the busiest sea routes in the world. The literature provides evidence of unsustainable fishing levels in the nominated area. Overharvesting of invertebrates (including within designated nature reserves) has resulted in major declines of some species. It is not known whether the harvesting of intertidal benthos is significantly affecting shorebirds. The Bohai Gulf in turn, anticipated in a Phase II extension, is known to contain major oil and gas reserves, and is subject to offshore production.

The complete transformation of all major rivers (sediment loads, water quality and quantity, flow regimes etc.) is a major factor in altering the natural systems of the nominated property and its context. Invasive alien species include a cordgrass species, *Spartina alterniflora*, which originates from the Atlantic coast of North America. Following its deliberate introduction to China, the grass is now dominating large parts of the remaining marshes along the Yellow Sea coast. Climate change is a concern along the coast that in many ways may affect both the ecoregion and the complex EAAF.

In conclusion, IUCN considers that the property as nominated does not satisfy the conditions of integrity given that:

With respect to criterion (ix) the nominated property is compromised due to upstream dams that have changed the course of the rivers. The diminished volume of sediments reaching the coast, land reclamation (and erosion), ports and infrastructure for development projects, and artificial wetlands and channels found in the buffer zone are all indications of the large modification of the natural processes. The boundaries and size of the components of the present Phase I nomination draw into question the capacity of the sites to allow long-term functioning of healthy ecological and biological processes.

Concerning criterion (x), the combination of the small representation of the overall system (intertidal zone of the Yellow Sea) including the exclusion of other key habitats in the Jiangsu Province frequented by important and threatened intertidal waterbird species) and other non-intertidal or mudflat habitats, like natural marshes and wetlands, and the profound anthropogenic changes (land reclamation for infrastructure development) and threats (included climate change and invasive alien species) call the applicability into question. In the two components, many of the key habitats (marshlands and wetlands) for these bird species are not natural. The use by migratory birds of artificial marshes, intertidal areas, and wetlands increase the complexity of understanding if the site meets the integrity requirements. More consideration of the linkages between the supratidal coast and the intertidal system would be important.

In addition, there is no connectivity between the two nominated components. Both areas were formerly part of one much larger protected area. In the nomination dossier, the two components are separated, in part because of the Dafeng Port Economic Area.

Given the very high level of anthropogenic modification and pressures to radial sand ridges, and the very limited representation of the scale and diversity of the large system in the nomination (Phase I), the integrity can be considered marginal from an ecosystem perspective, but possibly acceptable from the narrow perspective of critical importance for bird migration. IUCN concludes that this can only be fully evaluated through the nomination of a single revised serial property which includes the full range of the components in order to reflect the natural wealth and diversity of the ecoregion.

5. ADDITIONAL COMMENTS

5.1 Consideration in relation to serial properties

a) What is the justification for the serial approach?
A serial approach is proposed in China due to the dispersed natural distribution and the anthropogenic fragmentation of the mudflats and other coastal ecosystems. The intertidal system no longer exists as an uninterrupted system. A serial approach is the only practical option to protect critical natural habitat and functions across what is one integrated ecosystem. IUCN notes that the inclusion of all proposed phased components is considered necessary to fully justify the serial approach.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the Operational Guidelines?
The two nominated components of Phase I are directly linked in many ways. They were previously part of one much larger protected area. However, they are presented as two components due in part to the Dafeng Port and Marine Economic Development Zone between them.

The nomination dossier is limited to Phase I so does not provide sufficient detail about the Phase II components to make a determination of functional linkages, nor to fully evaluate OUV.

c) Is there an effective overall management framework for all the component parts of the nominated property?
From a transboundary ecosystem perspective, the efforts to coherently manage the shared conservation values are in their infancy. Phase I involves only two components, both of which are under the same provincial and local jurisdictions. However, the full complement of an eventually much larger number of components will completely change the complexity and require coordination among numerous jurisdictions and institutions. As the nomination covers only Phase I at this stage, governance structures and management plans for all the component parts are not described. IUCN considers that given the clear intention to create a larger more complex serial site, the identification of clear mechanisms to ensure effective governance, coordination and integration will be a critical follow up need.

6. APPLICATION OF CRITERIA

Migratory Bird Sanctuaries along the Coast of Yellow Sea-Bohai, Gulf of China (Phase I) has been nominated under natural criteria (ix) and (x).

Criterion (ix): Ecosystems/communities and ecological/biological processes
The dynamics of the intertidal mudflat system are impressive. Enormous amounts of river sediment discharge have been interacting for millennia with the ocean current to form intertidal mudflats and unique radial sand ridges. Many of the mudflat areas serving as bird foraging and resting areas are formed by sediments from the Tibetan Plateau thousands of kilometres away. The large-scale phenomenon is undoubtedly a globally outstanding example of a coastline and intertidal mudflat ecosystem with extraordinary wetland ecosystems that

have resulted from longstanding hydrological and geo-tectonic processes dating back to the Pleistocene.

The two components of the property nominated as Phase I are located in a region where the river and marine ecosystems interact. These two components represent the typical characteristics of the coastal and marine ecosystems and their changes in landscape pattern, and highlight the evolution of their plant communities against the background of the exceptionally dynamic changes in the coastal landscape. At the same time, given that only a relatively small area of the overall Chinese system is currently being nominated, it is less than clear that it can *per se* be considered as an adequate representation at the process level.

The combination of three factors—the small representation of the overall system at this stage, the profound anthropogenic changes that have already occurred, and the scale of pressures for further human uses—call the applicability of this criterion into question. However, a complete nomination of all components, together with documentation of and unambiguous commitment to ongoing and planned restoration, would have the potential to meet criterion (ix).

IUCN considers that the property as currently nominated does not meet this criterion, however, a single revised nomination of the full range of the components of the proposed series as a whole has the potential to meet criterion (ix).

Criterion (x): Biodiversity and threatened species

The nomination dossier documents the use of the nominated property by 680 species of vertebrates, including 415 species of birds, 26 species of mammals, 9 species of amphibians, 14 species of reptiles, 216 species of fish, as well as 165 species of zoobenthos. The globally significant values of the full serial nomination relate to intertidal habitats that are part of the key stopover sites, wintering grounds or breeding grounds for some of the world's most threatened bird species.

The YS-1 component of the nomination is important for the critically endangered Spoon-billed Sandpiper, with only hundreds of individuals left in the world. Experts consulted link the very survival of the species to the fate of the nominated area, where almost the entire global population of the species roosts, feeds and molts in spring and autumn. According to supplementary information provided by the State Party, 80% of the population of the charismatic and culturally revered Red-crowned Crane winter in the nominated property. Nearly 20% has been found to winter in Shandong Yellow River Delta National Nature Reserve, proposed for Phase II. Furthermore, the EAAF Partnership has ranked Jiangsu Yancheng National Nature Reserves (YS-2) as being among the top three of 1,030 key wetlands assessed in terms of bird species diversity. Other noteworthy birds for which the nominated areas are critically important include Nordmann's Greenshank, the Great Knot, the Far Eastern Curlew and the Reed Parrotbill (*Paradoxornis heudei*). However, while the nomination documents species occurrence at some of the component sites, little comparative population data is provided for the components proposed within the eventual full serial property.

There is no doubt the intertidal zones of the Yellow Sea-Bohai Gulf are of global importance, especially for the congregation of many species of migratory birds that use the EAAF. However, significant uncertainty remains on what proportion of some of these populations are being hosted by components of Phase I compared to those of Phase II. For example, the Critically Endangered Chinese Crested-Tern depends on a different part of the coastline for its survival, which is far from the areas nominated under the current Phase I, and would benefit from a possible future nomination. The main question is whether the currently nominated areas are a sufficiently meaningful and viable representation of the much larger ecosystem. Thus, IUCN concludes that a complete nomination of all components, together with unambiguous commitment to and clear documentation of ongoing and planned restoration, would have the potential to meet criterion (x).

IUCN considers that the property as currently nominated does not meet this criterion, however, a single revised nomination of the full range of the components of the proposed series as a whole has the potential to meet criterion (x).

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC/19/43.COM/8B and WHC/19/43.COM/INF.8B2;

2. Defers the nomination of the **Migratory Bird Sanctuaries along the Coast of Yellow Sea-Bohai Gulf of China (Phase I) (China)** in order to allow the State Party to:

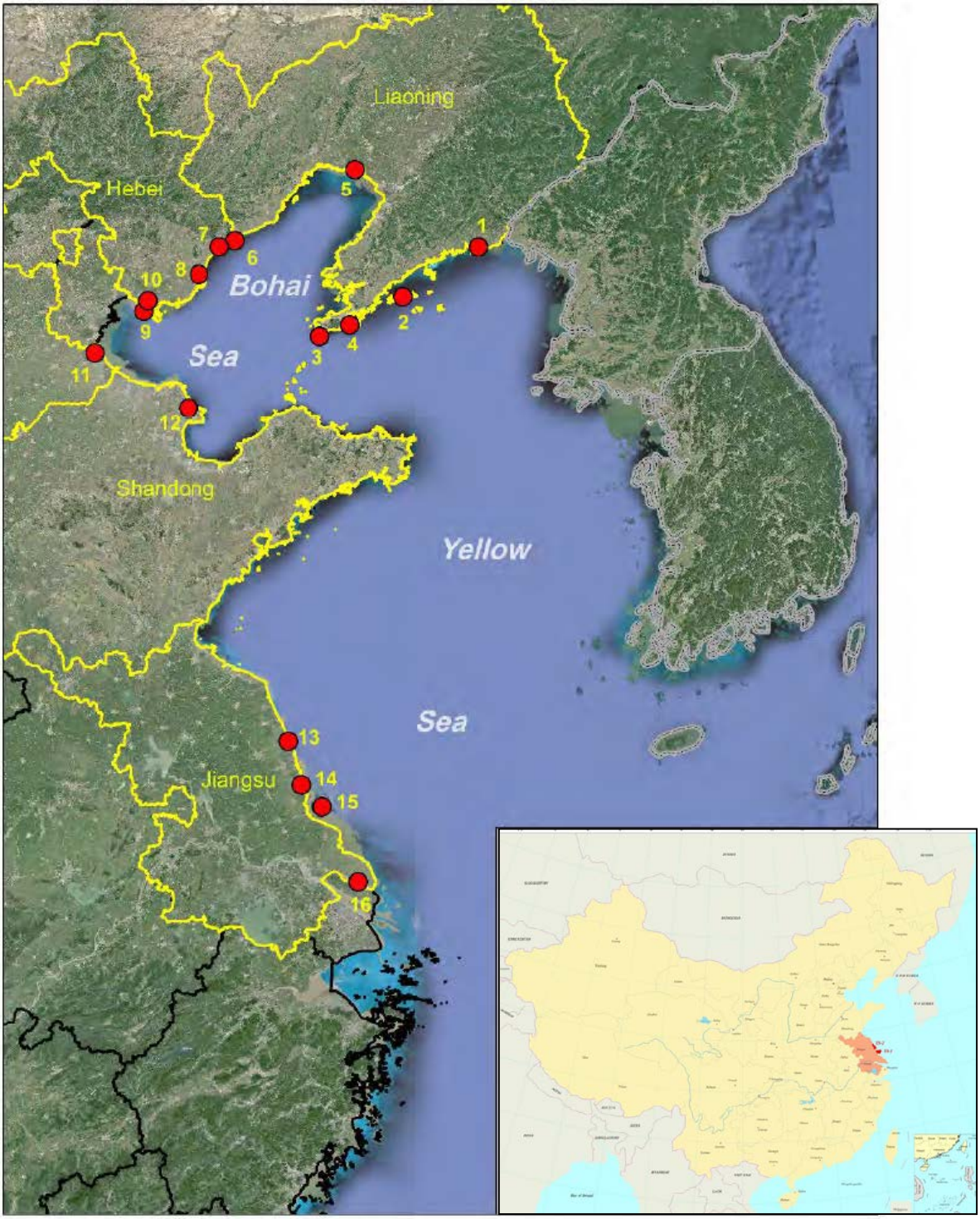
a) Prepare a more comprehensive and detailed overview and analysis of priority conservation areas in the Yellow Sea and Bohai Gulf, building upon the existing nomination and planned phases, fully taking into account ecosystem and habitat diversity of the coastal system, proposed boundaries, values (including species occurrence, abundance and conservation status), threats, integrity, protection and management;
b) Include in a single revised nomination the full range of the components of the proposed series as a whole, in order to reflect the natural wealth and diversity of the ecoregion and to meet integrity requirements;

c) Confirm, with appropriate support from peer-reviewed literature, the specific presence of the attributes of Outstanding Universal Value within the boundaries of the nominated property, including the presence and size of populations of any endemic and threatened species, and of globally significant migratory bird species;
d) Clearly demonstrate that the integrity of all natural attributes contributing to the stated Outstanding Universal Value can be conserved within each of the component parts of the series, and include a map indicating which areas of the nominated property are in a natural state, and which have been, or are being, restored;
e) Ensure that there are no unacceptable negative effects of development on the attributes of conservation significance in each of the components of the nominated property, including any negative effects of wind turbines, pollution (including noise pollution), land reclamation and infrastructure development; and
f) Provide evidence of more effective planning for the increasing tourism demand, including the development of appropriately scaled and low impact tourism in the nominated property.

3. Notes with appreciation the confirmed commitment demonstrated by the State Party and local authorities to protecting the Tiaozini area of the Yellow Sea, as an integral part of the proposed World Heritage nomination;

4. Strongly encourages the State Party to coordinate its plans for nominations with other State Parties in the EAAF, in relation to the potential for future transboundary serial nominations, and/or extensions, that more fully reflect the habitat needs and patterns of use of migratory birds across the wider Yellow Sea region.

Map 1: Location of the nominated property and the proposed 16 components of phased final nomination.



Map 2: Nominated property and buffer zone (including added Tiaozini area)