

Designation date: 04/09/95 Ramsar Site no. 750

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

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

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 14, 3rd edition). A 4th edition of the Handbook is in preparation and will be available in 2009.
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.

1. Name and address of the compiler of this form:

Ms. Connie Ka-yan NG,
Wetland and Fauna Conservation Officer (Monitoring),
Wetland and Fauna Conservation Division,
Agriculture, Fisheries and Conservation Department,
Government of Hong Kong Special Administrative Region,
7/F., Cheung Sha Wan Government Offices,
303 Cheung Sha Wan Road,
HONG KONG.

Tel.: 852 2150 6922

Fax: 852 2377 4427

Email: ka_yan_ng@afcd.gov.hk

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

5 December 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.

Mai Po Marshes and Inner Deep Bay (also referred as 米埔內后海灣 or Mai Po Inner Deep Bay)

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:

No major changes to the ecological attributes, namely waterbird abundance and species composition, biodiversity, of the Ramsar Site are observed.

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.

The boundary of the Ramsar Site is delineated following natural watercourse and geopolitical boundary in the north and physical boundaries such as roads and catchment in the South.

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.

Centre coordinates: 022°29'20" N 114°01'44" 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.

Yuen Long, Northwest New Territories, Hong Kong Special Administrative Region.

Population of Yuen Long District: 578,529 (from 2011 census, <http://www.census2011.gov.hk/en/district-profiles/yuen-long.html>)

Distance between the centre coordinate of the Ramsar site and the closest town (Tin Shui Wai Park, Tin Shui Wai) is approximately 4.5km.

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

0 m (sea level)

11. Area: (in hectares)

1,540.

12. General overview of the site:

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

A shallow bay with extensive intertidal mudflats backed by mangal, tidal shrimp ponds (*gei wais*), fishponds, and reedbed in some *gei wais* and along the coast. The site serves as an important overwintering site to the waterbirds of the East Asian-Australasian Flyway and accommodates a wide variety of flora and fauna. The mangal is the largest in Hong Kong and one of the few largest in China while the reedbed is the largest in Hong Kong and Guangdong Province. The fishponds are generally used for commercial fish farming though some have been abandoned. The *gei wais* which were used for traditional culturing of penaeid shrimps in Hong Kong have been preserved as an important semi-artificial or artificial habitat for the waterbirds.

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).

Justification of each criterion is listed below.

Criterion 2: The site regularly holds 23 globally threatened species, according to the 2012 IUCN Red List (13 listed species in 1990-94) as show in the following table.

Common Name	Scientific Name	IUCN Red list Status	CMS Appendix	CITES Appendix	National Status
Christmas Island Frigatebird	<i>Fregata andrewsi</i>	CR			Grade I

Baer's Pochard	<i>Aythya baeri</i>	CR	Appendix I		
Siberian Crane	<i>Grus leucogeranus</i>	CR	Appendix I	Appendix I	Grade I
Spoon-billed Sandpiper	<i>Eurynorhynchus pygmeus</i>	CR	Appendix I		
Oriental Stork	<i>Ciconia boyciana</i>	EN	Appendix I	Appendix I	Grade I
Black-faced Spoonbill	<i>Platalea minor</i>	EN	Appendix I		Grade II
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	Appendix I	Appendix I	Grade II
Dalmatian Pelican	<i>Pelecanus crispus</i>	VU	Appendix I	Appendix I	Grade II
Swinhoe's Egret	<i>Egretta eulophotes</i>	VU	Appendix I		Grade II
Phillippine Duck	<i>Anas luzonica</i>	VU			
Lesser White-fronted Goose	<i>Anser erythropus</i>	VU	Appendix I		
Greater Spotted Eagle	<i>Aquila clanga</i>	VU	Appendix I	Appendix II	Grade II
Great Knot	<i>Calidris tenuirostris</i>	VU			
Imperial Eagle	<i>Aquila heliaca</i>	VU	Appendix I	Appendix I	Grade I
Far Eastern Curlew	<i>Numenius madagascariensis</i>	VU			
Relict Gull	<i>Icthyophaga relicta</i>	VU	Appendix I	Appendix I	Grade I
Saunders's Gull	<i>Chroicocephalus saundersi</i>	VU	Appendix I		
Fairy Pitta	<i>Pitta nympha</i>	VU			Grade II
Styan's Grasshopper Warbler	<i>Locustella pleskei</i>	VU			
Manchurian Reed Warbler	<i>Acrocephalus tangorum</i>	VU			
Brown-chested Jungle Flycatcher	<i>Rhinomyias brunneatus</i>	VU			
Japanese Yellow Bunting	<i>Emberiza sulphurata</i>	VU			
Yellow-breasted Bunting	<i>Emberiza aureola</i>	VU	Appendix I		

Criterion 3: The site is the type locality for 16 species of invertebrates as shown in the following table, and the majority of which are not reported elsewhere in the Indo-Malay biogeographic region according to the best available information.

Taxonomy	Species
Arthropoda	
Sesarinae, Decapoda	<i>Chiromantbes maipoense</i>
Aoridae, Amphipoda	<i>Grandidierella</i> sp. nov.
Corophidae, Amphipoda	<i>Kamaka</i> sp. nov.
Melitidae, Amphipoda	<i>Melita</i> sp. nov.
	<i>Victoriopisa</i> sp. nov.
Talitridae, Amphipoda	<i>Talorchestia</i> sp. nov.
Apseudidae, Tanaidacea	<i>Discapsendes</i> sp. nov.
Pectinariidae, Polychaeta	<i>Lagis crenulatus</i>
Noctuidae, Lepidoptera	<i>Schrankia bilineata</i>
Geometridae, Lepidoptera	<i>Thalassodes maipoensis</i>
Arachnida	
Scheloribatidae, Acarina	<i>Domitorina rostrata</i>
Annelida	
Oligochaeta	<i>Limnodriloides biforis</i>
	<i>L. fraternus</i>
	<i>Rhizodrilus russus</i>
Mollusca	
Bivalvia	<i>Pseudopythina maipoensis</i>

Nemertea	
Nemertea	<i>Procephalothrix orientalis</i>

Moreover, a new species of bent-winged firefly *Pteroptyx maipo* (Coleoptera: Lampyridae), which was first found in the Hong Kong Wetland Park, occurs in the site with limited distribution in the Deep Bay area. So far this species can only be found in Hong Kong. The site also harbors the damselfly species *Mortonagrion hirosei* (Four-spot Midget), which is classified as near-threatened (IUCN 2012) and only sparsely occurs in Hong Kong, Guangdong Province of China, Japan and Taiwan.

Criterion 5: In 2007-2012, Deep Bay supported on average 83,034 waterbirds in mid-winter (compared to 48,500 in 1990-94), according to regular monthly survey of Waterbird Monitoring Programme. The breakdown of winter population from 2007/08 to 2011/12 is as follows:

	2007-08	2008-09	2009-10	2010-11	2011-12
Total peak number of waterbirds	90,986	87,633	87,379	76,679	72,495

Criterion 6: The site regularly holds over 20% of the global population of Black-faced Spoonbill (*Platalea minor*) in 2007-2012. There are another 26 species in this site having more than 1% of threshold population of Eastern Asia. Please refer to [Appendix I](#) for the yearly count from winter 2007/08 to 2011/12.

Species	Known max. no. in winter 2007-08 to 2011-12 / Percentage	1% threshold
Great Cormorant <i>Phalacrocorax carbo</i>	11,144 / 11.14%	1%=1,000; sub-spp <i>sinensis</i>
Great Egret <i>Ardea alba</i>	1,146 / 1.15%	1%=1,000
Black Stork <i>Ciconia nigra</i>	1 / 1%	1%=1
Black-faced Spoonbill <i>Platalea minor</i>	496 / 24.8%	1%=20
Great Crested Grebe <i>Podiceps cristatus</i>	420 / 1.2%	1%=350
Northern Pintail <i>Anas acuta</i>	2,413/1.01%	1%=2,400
Northern Shoveler <i>Anas chrypeata</i>	14,253/2.85%	1%=5,000
Tufted Duck <i>Aythya fuligula</i>	4,762/1.98%	1%=2,400
Black-winged Stilt <i>Himantopus himantopus</i>	1,703/1.7%	1%=1,000
Pied Avocet <i>Recurvirostra avosetta</i>	16,123/16.12%	1%=1,000
Pacific Golden Plover <i>Pluvialis fulva</i>	1,258/ 1.26%	1%=1,000
Little Ringed Plover <i>Charadrius dubius</i>	349/1.4%	1%=250
Kentish Plover <i>Charadrius alexandrinus</i>	4,328/4.33%	1%=1,000
Greater Sand Plover <i>Charadrius leschenaultii</i>	941/1.19%	1%=790
Black-tailed Godwit <i>Limosa limosa</i>	3,432/2.45%	1%=1,400
Eurasian Curlew <i>Numenius arquata</i>	1,602/1.6%	1%=1,000
Spotted Redshank <i>Tringa erythropus</i>	1,690/6.76%	1%=250
Common Redshank <i>Tringa totanus</i>	2,257/2.26%	1%=1,000
Common Greenshank <i>Tringa nebularia</i>	4,493/4.49%	1%=1,000
Nordmann's Greenshank <i>Tringa guttifer</i>	45/9%	1%=5
Terek Sandpiper <i>Xenus cinereus</i>	619/1.24%	1%=500
Asian Dowitcher <i>Limnodromus semipalmatus</i>	441/1.92%	1%=230
Red-necked Stint <i>Calidris ruficollis</i>	3,861/1.21%	1%=3,200
Curlew Sandpiper <i>Calidris ferruginea</i>	9,454/6.75%	1%=1,400
Spoon-billed Sandpiper <i>Eurynorhynchus pygmaeus</i>	4/1.33%	1%=3
Gull-billed Tern <i>Gelochelidon nilotica</i>	245 /2.45%	1%=100

Reference: Wetlands International. 2012. Waterbird Population Estimates – fifth edition. Wetlands International, Wageningen, The Netherlands. Available from <http://wpe.wetlands.org> (accessed July 2012)

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:

Indo-Malay Biogeographic Realm, Tropical and Subtropical Moist Broadleaf Forest

b) biogeographic regionalisation scheme (include reference citation):

Based on the delineation of eco-regions defined in the “Terrestrial Eco-regions of the World” by Olson et al. 2001.

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.

The Ramsar site is a natural shallow estuarine bay lying within the Yuen Long Basin. The average water depth is about 2.9 m and the mean tidal range is 1.4 m. Inner Deep Bay receives water and sediments from both Hong Kong and Shenzhen.

The bedrock is sedimentary sands and silts that were metamorphosed and formed when the area was a neritic swamp. Sediments of varying grain sizes continued to deposit as the deltaic floodplain built up in a naturally dynamic process. The shoreline progradation has been strengthened by the presence of the mangal fringing the bay.

The soils in the Ramsar site were formed from alluvial deposits and colluvial material. The soil is poorly drained and frequently highly saline, rendering them of little agricultural uses. The sediment forming the core part of the intertidal mudflat is predominantly clay and silt.

Salinity of the intertidal water shows a clear trend dependent on the seasonality in which the values tend to increase from late summer and approach the highest in winter/early spring. After entering the late spring and early summer, salinity could drop to very low due to the increase of rainfall. Relatively high levels of organic nutrients are present in the water and have direct consequence on the concentration of dissolved oxygen. Sediment in the intertidal mudflat of the Ramsar Site is characterised by heavy loading of organic materials and anaerobic environment, which is considered one of the major factors in shaping the benthic fauna community structure. The major infauna groups are oligochaete and polychaete which are low in diversity but high in abundance and tolerant to pollution.

The climate of Hong Kong is sub-tropical, and under the strong influence of monsoons. The temperature ranges from 12oC to 32oC and begins to increase from mid-March. Rainfall occurs mainly from April to September. The mean annual rainfall of the Ramsar site of approximately 1,400 mm is low compared with the rest of the territory because the site is situated in the rain shadow of the Tai Mo Shan range. Heavy rain associated with tropical cyclones may last for a few days. From November, the temperature starts to decrease until mid-March.

17. Physical features of the catchment area:

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

In addition to the essential information recorded in Section 14, the Deep Bay area forms part of the Pearl River estuary, which is the largest river in southern China, having a catchment of around 450,000 km² and an annual flow of around 308 billion m³.

18. Hydrological values:

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

The site helps to alleviate flood problems in the northwest of the territory. The mangal are of value in stabilizing the shore of the bay.

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 • ZkI

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 categories	Wetland types in the Ramsar site	Percentage of extent in the Ramsar site
1	Fishponds and tidal shrimp ponds (<i>gei wais</i>)	40%
G	Intertidal mudflats	23%
I	Intertidal mangal	19%

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 intertidal mudflat supports a large number of waterbirds along the East Asian-Australasian Flyway. The rich organic materials in the sediment support an abundance of benthic fauna e.g. oligochaete and polychaete worms, mudskippers, fiddler crabs which in turn become food of the waterbird.

The intertidal mangal in the Ramsar site was developed from the fringe of intertidal mangal remaining after the construction of fishponds and *gei wais* during the 30's (see below). *Kandelia obovata* is the most dominant species and is followed by *Avicennia marina*. *Aegiceras corniculatum* and *Acanthus ilicifolius* are also common at the edge or undercanopy. A few old trees of the landward species *Bruguiera gymnorrhiza* and *Excoecaria agallocha* in the *gei wais* reveal the floristic composition of the intertidal mangal before the construction of *gei wais*.

The fishponds are the most dominant habitat type in the Ramsar site in terms of size. They are the main supply of freshwater fish in the territory. The commercial fish-farming activity is regarded as wise use of wetland in the Ramsar site. Both freshwater and marine species are farmed here. Like *gei wais*, fishponds would be drained during harvesting and maintenance. Waterbirds would be attracted to feed on the remaining small fish or invertebrates of low economic value. They could also forage in the abandoned fishponds where fish and invertebrates are available.

Gei wais are tidal shrimp ponds traditionally used for the farming of penaeid shrimps in South China and Asia. In Deep Bay, *gei wais* were created from the intertidal mangal during the 30's and were formed by building bunds confining the mangal. Vegetations inside the ponds are preserved because they are the natural food supply to the shrimps and fish. *Gei wais* are connected with the open water through sluice gates, where nets can be mounted, installed at the seaward bund. During harvesting, fish and shrimp fries

can be drawn from the estuary in autumn when the tide is high. Throughout winter, *gei wais* are drained in rotation and kept drained for a long period of time to attract waterbirds to feed on the remaining small fish or invertebrates. Most of the *gei wais* in the Ramsar site are now managed as roosting and foraging habitats for migratory birds or freshwater habitats for dragonflies. *Gei wais* show how the naturally high productivity of the estuary can be utilized and how artificial or semi-artificial habitats could support a high diversity of wildlife under proper management.

The reedbed (*Phragmites australis*) supports a few hundred species of insects in the Ramsar site. It also provides shelters to rails and coots, migratory passerines and other fauna. Other common grasses and sedges include Short-leaved Malacca Galingale *Cyperus malaccensis* var. *brevifolius* and Coastal Bulrush *Scirpus littoralis*.

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.*

The intertidal mangal provides shelter and food to a large diversity of aquatic fauna, including some valuable aquaculture species such as penaeid shrimps and the Mangrove Crab *Scylla paramamosain*.

Seagrass *Halophylla beccarii* and *Ruppia maritima* have been recorded in the Ramsar site.

Sonneratia spp., which was exotic to the territory, can be found in the Ramsar site. They are probably the descendents of the mangrove afforestation in the Futian National Nature Reserve which is in north to the Ramsar site and shares the same estuary. The ecological role of the species in the area has been a subject of further investigation.

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.*

The area regularly supports a large numbers of over 70 species waterbirds in winter including 35 globally threatened and near-threatened species. The most spectacular species in the site is the Black-faced Spoonbill, which is an endangered species specialized to the intertidal habitats. The Ramsar site accommodated up to 24.8% of the over-wintering population, which was the second largest in the world, of the species in 2007-2012. Black-faced Spoonbills prefers to forage and roost in the intertidal mudflat and *gei wais* which are managed for the user of the species in winter. A tailored made conservation plan is in place for the better protection of this species.

The aquatic invertebrate community in intertidal mudflat are numerically important and functional components of the ecosystem, occurring at high densities or biomass in various microhabitats. The assemblage of mangrove crabs, namely the sesarminae crab *Parasesarma affinis*, *Perisesarma bidens* and *Perisesarma maiipoense* is a conspicuous component of the mangrove floor community and acts as an important agent effecting mangrove litter turnover.

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:

The commercial fishpond culture has been practiced since the 30's providing freshwater fish for local consumption. Most fishponds practice polyculture of carps mixed with tilapia or grey mullet and the remaining ones carry out monoculture of giant grouper and scat.

This is also the only place in Hong Kong where *gei wais*, the traditional way of farming penaeid shrimp utilizing the naturally high productivity of estuary are preserved. The site is one of the well-known sites in the territory for environmental education to students and the general public. Education centres, birdhides and boardwalks are available for indoor exhibition on wetland conservation, outdoor wetland experiences and birdwatching. A small education centre is in place in the Mai Po Marshes Nature Reserve to demonstrate the operation of *gei wai* practice.

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?

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: the great majority of the site is government land, but most fishponds have been leased or licensed to operators engaged in fish farming.

b) in the surrounding area: mainly leased or licensed land used for fish farming or residential uses in accordance with the land use zones as appropriate.

25. Current land (including water) use:

a) within the Ramsar site: Nature conservation, scientific research, nature education and ecotourism, bird watching and nature appreciation, fish farming, and small-scale rural settlement.

b) in the surroundings/catchment: Brackish/freshwater fishponds, open storage, and residential area. The Hong Kong Wetland Park (HKWP) located at the northern part of Tin Shui Wai adjacent to the Ramsar site is a 61 hectares nature-based theme park. The HKWP comprises a 60-hectare recreated wetland reserve with freshwater marsh, ponds, mangroves, reedbed and mudflat. The HKWP project upgrades the originally intended ecological mitigation area into a conservation, education and eco-tourism facility for local residents and overseas visitors. The Park was opened in 2006.

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: There have been and will also be necessary to have drainage related works and the subsequent routine maintenance of the drainage channels at the site. Pollutants, mainly organic

nutrients, from the Shenzhen River and Shan Pui River existed and their accumulation could adversely affect the ecological values of the Ramsar site.

b) in the surrounding area: Major development activities which may have detrimental effect on the site included pollution in the catchment, and applications for reclamation of fish ponds for residential developments, open storage areas and other activities around the site. There have been and will be necessary to have drainage related works and road works and the subsequent routine maintenance of the drainage channels at the surrounding area.

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.

According to the local ordinances in Hong Kong,

- Under the Wild Animals Protection Ordinance of Hong Kong, a Restricted Area was delineated to cover the Inner Deep Bay intertidal mudflats for a total area of 850 hectares in February 1996.
- There are five Sites of Special Scientific Interests inside the Ramsar site. The Mai Po and Inner Deep Bay area also joined the East Asian – Australasian Flyway with a view to better protecting migratory birds of the region.
- The land area around Deep Bay including the Ramsar site is covered by statutory land use plans and development is controlled by the Town Planning Ordinance. All development proposals must be made to the Town Planning Board for consideration in accordance with the Ordinance. To protect the ecological integrity of the Ramsar site from incompatible development, the Board has designated a Wetland Conservation Area (WCA) and a Wetland Buffer Area (WBA) for the Deep Bay area and provided guidelines to guide and control developments within the area.
- The WCA basically covers the landward part of the Ramsar site. The Guidelines stipulate that new development within WCA should not be allowed unless it is required to support the conservation of the area's natural features and scenic qualities. New development within WBA would not be considered unless the applicant demonstrates that the proposed development would have insignificant impact on the environment, ecology, drainage, sewerage and traffic in the area including the Ramsar site.
- The Inner Deep Bay has been declared Water Quality Control Zone with water quality objectives defined in 1991. Moreover, the full implementation of statutory controls on livestock waste has eventually resulted in significant reduction of organic pollution entering Deep Bay.

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 Mai Po Inner Deep Bay Ramsar Site Management Plan was adopted and implemented by the Agriculture, Fisheries and Conservation Department (AFCD) since 1998. The Plan was reviewed and updated in 2011.

The Plan stipulates the management goals and strategies as well as action plans for the Ramsar site. The plan lays down a general framework for the conservation and wise use of the area – and to raise public awareness of the importance of Mai Po and Inner Deep Bay wetlands. Based on the habitats, ecological values and existing land uses, the plan divides the Ramsar site into four different management zones, i.e. the Core Zone, the Biodiversity Management Zone, the Wise Use Zone and the Private Land Zone. Each management zone has its specific management objective and restrictions.

d) Describe any other current management practices:

AFCD has implemented a Baseline Ecological Monitoring Programme to keep track of the ecological conditions of the Ramsar site since 2001. The monitoring programme focuses on the ecological characters including the community dynamics of benthic fauna which are one of the food sources of the migratory bird, the habitat extent and condition using the satellite image interpretation and analysis of bird count records. In parallel, water quality, sediment quality and sedimentation rate of the inter-tidal mudflats are monitored to provide supplementary information on the ecological conditions. The results of the programme would be useful in the formulation of management plan.

In addition, AFCD Nature Wardens regularly patrol the Ramsar Site which included the Restricted Area to enforce, if needed, the Wild Animals Protection Ordinance, which also prohibits hunting or possession of protected animals (including all wild birds) throughout the territory.

The World Wide Fund For Nature Hong Kong (WWFHK) has assisted the Government to manage the Mai Po Marshes Nature Reserve (MPMNR) of about 270 hectares since 1984. The prime goals of their management are to conserve, maintain and improve wetland habitats and the biodiversity and key species in the Deep Bay area. WWFHK carries out their daily management of the MPMNR based on a Management Plan for the Mai Po Marshes Wildlife Education Centre and Nature Reserve which was prepared according to the objectives and restrictions of the management zones of the Ramsar site. Wetland habitats including *gei wais* and reed bed are managed to provide roosting and foraging sites suitable to the migratory birds. WWFHK offers educational walks to students and the general public under entry quota.

28. Conservation measures proposed but not yet implemented:

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

The Mai Po Inner Deep Bay Ramsar Site Management Plan for the next five years cycle will be prepared with updated information and ecological conditions of the Ramsar Site when appropriate.

29. Current scientific research and facilities:

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

The tertiary institutes in the territory have been conducting studies on the ecology, hydrology and geology of the area. WWFHK has a field studies centre in the Mai Po Marshes Nature Reserve providing field laboratory and accommodation facilities for training and scientific studies purposes in the area.

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.

The Agriculture, Fisheries and Conservation Department manages the Hong Kong Wetland Park (HKWP) which was fully opened after the phase 1 visitor centre had been opened in 2000. Since 2006, the HKWP implements Communication, Education, Participation and Awareness (CEPA) Programme as stipulated by the Ramsar Convention. The education programmes of HKWP include workshop, guided tours and public lectures offered to schools and general public. It has also established a volunteer scheme with an aim to promote the general public to serve the community, and facilitate the establishment of Wetland Link International - Asia to build up a network between wetland centers in Asia. HKWP provides ecotourism facilities to serve both local and overseas tourists, which comprises 10,000 sq. meter Visitor Centre, and 60-hectare man-made Wetland Reserve which provide education and recreation venue with a theme to demonstrate the functions and values of wetlands and call for the need for wetland conservation to local and overseas visitors.

WWFHK has an education centre, 1 field studies center, 1 *gei wai* museum, 1 nature trail, 2 boardwalks and 11 observation hides at the Mai Po Marshes Nature Reserve. The work of WWFHK has been focused on community awareness, habitat and infrastructure management, monitoring and research,

visitor marketing and management, and South China wetland management training. Since 1991, WWFHK has been organising the Wetland Management Training Programme at the MPMNR for wetland managers and decision makers from the Mainland China. These activities are complementary to the CEPA activities undertaken by HKWP. The Hong Kong Bird Watching Society conducted the waterbird monitoring programme of the Ramsar site and training for bird surveyors.

31. Current recreation and tourism:

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

Since 2006, around 440,000 visitors visit the Hong Kong Wetland Park annually. Within the Mai Po Marshes Nature Reserve, over 40, 000 people annually, of which 11, 000 are students, visited for bird watching or informal education visits which were guided by WWF HK.

32. Jurisdiction:

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

The site is within the Hong Kong Special Administrative Region of the People's Republic of China. The Agriculture, Fisheries and Conservation Department takes charge of the overall conservation management of the Ramsar site.

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.

Senior Wetland and Fauna Conservation Officer,
Wetland and Fauna Conservation Division,
Agriculture, Fisheries and Conservation Department,
7/F Cheung Sha Wan Government Offices,
303 Cheung Sha Wan Road, Kowloon,
Hong Kong.

Tel.: +852 2150 6922

Fax: +852 2377 4427

Email: faunaenq@afcd.gov.hk

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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Hong Kong Laws:

Forests and Countryside Ordinance, Chapter 96

Town Planning Ordinance, Chapter 131

Wild Animals Protection Ordinance, Chapter 170

Water Pollution Control Ordinance, Chapter 358

Please return to: **Ramsar Convention Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**

Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • e-mail: ramsar@ramsar.org

Appendix I: Yearly count of waterbirds at Mai Po Inner Deep Bay Ramsar Site which have more than 1% of threshold population of Eastern Asia.

	IUCN Red List status	WPE5 estimate A: <10,000 B: 10,000 – 25000 C:25,000 – 100,000 D: 100,000 – 1M E: >1M	1% Flyway threshold (WPE5 estimate)	Known max no. in 2007/08 to 2011/12	Percentage of flyway population in 2007-08 to 2011-12	2011/12 minimum	2010/11 minimum	2009/10 minimum	2008/09 minimum	2007/08 minimum
Bird Species										
Great Cormorant		C	1,000	11,144	11.14	9,636	10,023	10,758	8,736	11,144
Great Egret		B/C	1,000	1,146	1.15	1,146	719	656	978	712
Black Stork		1-500	1	1	1.00	1	0	0	0	0
Black-faced Spoonbill	En	1,830-2,700	20	496	24.80	488	441	496	365	187
Great Crested Grebe		25,000 – 50,000	350	420	1.20	420	82	208	28	41
Northern Pintail		200,000 – 300,000	2,400	2,413	1.01	2,413	2,107	1,612	397	1,857
Northern Shoveler		500,000	5,000	14,253	2.85	7,560	8,822	11,795	4,852	14,253
Tufted Duck		200,000 – 300,000	2,400	4,762	1.98	3,308	4,762	3,126	2,816	796
Black-winged Stilt		C	1,000	1,703	1.70	1,124	542	1,703	1,614	670
Pied Avocet		100,000	1,000	16,123	16.12	14,604	10,944	13,883	13061	16,123
Pacific Golden Plover		100,000	1,000	1,258	1.26	1,258	1,142	539	731	642
Little Ringed Plover		25,000	250	349	1.40	136	120	206	349	228
Kentish Plover		100,000	1,000	4328	4.33	3,147	720	4,328	2,356	1,867
Greater Sand Plover		79,000	790	941	1.19	236	861	941	795	383
Black-tailed Godwit	NT	139,000	1,400	3,432	2.45	1,989	3,432	2,449	2,223	1,656
Eurasian Curlew	NT	100,000	1,000	1,602	1.60	1,128	1,602	1,075	1,065	1,116
Spotted Redshank		25,000	250	1,690	6.76	395	623	990	1,690	1,641
Common Redshank		B/C	1,000	2,257	2.26	1,795	1,577	1,473	2,215	2,257
Common Greenshank		100,000	1,000	4,493	4.49	3,129	2,574	3,495	4,366	4,493
Nordmann's Greenshank	En	400-600	5	45	9.00	35	45	16	34	26
Terek Sandpiper		50,000	500	619	1.24	406	424	619	600	571
Asian Dowitcher	NT	23,000	230	441	1.92	72	82	194	138	441
Red-necked Stint		315,000	3,200	3,861	1.21	311	990	3,861	2,779	913
Curlew Sandpiper		135,000	1,400	9,454	6.75	6,282	5,889	9,350	9,454	9,195
Spoon-billed Sandpiper	Cr	140-480	3	4	1.33	1	4	1	1	2
Gull-billed Tern		B/C	100	245	2.45	0	199	245	170	189

