Annex III

Profiles of NEAMPAN Sites

As of June 2016

NEAMPAN
North-East Asian
Marine Protected Area Network
NEASPEC

Contents

North-East Asian Marine Protected Areas Network (NEAMPAN)

Goal

Establish an effective, functional representative network of MPAs in North-East Asia for conservation of marine and coastal biodiversity and more efficient MPA management

Geographic Scope

NEAMPAN covers the seas of North-East Asia, where MPAs of the five member countries (China, Democratic People's Republic of Korea, Japan, Republic of Korea and the Russian Federation) are located

Target MPAs shall be selected by each member State in accordance with the Network's objectives

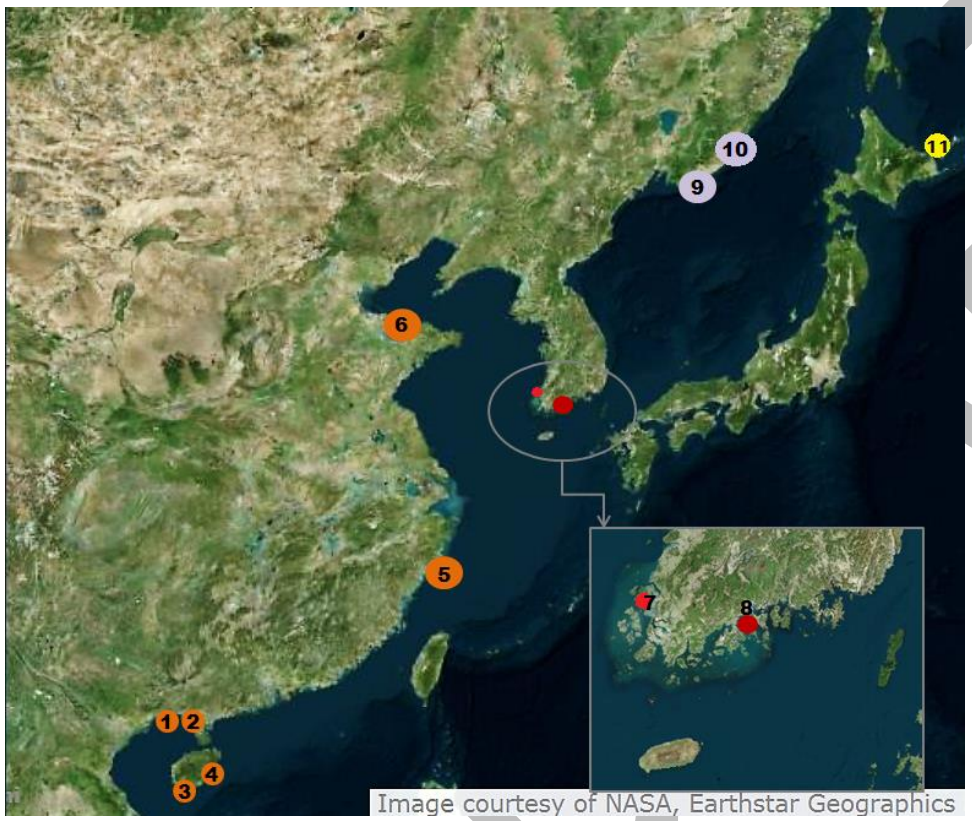
Priority activity areas

(1) Effective MPA management
(2) Sustainable use of marine resources
(3) Protection of key animals
(4) Collaboration with other relevant programs, networks and projects

Activity modalities

(1) Network meeting and information sharing
(2) Research and monitoring
(3) Capacity building
(4) Regional and global outreach

Locations of Target MPAs



1	Beilun Estuary National Marine Nature Reserve
2	Shankou Mangrove National Marine Nature Reserve
3	Sanya Coral Reef National Nature Reserve
4	National Nature Reserve of Dazhou Island Marine Ecosystems
5	Nanji Islands National Marine Nature Reserve
6	Changyi National Marine Ecology Special Protected Area
7	Muan wetland Protected Area
8	Suncheon Bay wetland Protected Area
9	Far-Eastern State Marine Biosphere Reserve
10	Sikhote-Alin State Natural Biosphere Reserve
11	Shiretoko National Park

Brief Profile of Target MPAs

MPA	Location	Year designated	Area	Key species or protected targets	Conservation status	Administration or management[1]	Int'l Network
CHINA: Nanji Islands National Marine Nature Reserve	Pingyang, Zhejing	1998[2]	196 km^2 (NEAMPAN) *206.29 km^2 (MPAtlas[3] and UNESCO[4])* *201.06 km^2 (including 190.71 km^2 of sea waters[5])*	Marine shellfish, algae, and their habitats	Marine Nature Reserve (MNR) *the first marine/coastal biosphere reserve in China*	State Oceanic Administration (N) Environmental Protection Bureau of Zhejiang Province (P) Nanji Islands Nature Reserve Administration (L)	UNESCO-MAB Biosphere Reserve (1998) EAAFP Network sites (as of May 2013, Nanji Islands Nature Reserve NOWPAP
CHINA: Shankou Mangrove National Marine Nature Reserve	Hepu, Guangxi	1990	80 km^2 (NEAMPAN & UNESCO-MAB[6]) *40 km^2 (Ramsar[7])*	Mangrove ecosystem (mangrove species endangered in China[8]); rare seagrass species; and the sea mammal (Dugong (*Dugong dugong*))	Marine Nature Reserve (MNR)	State Oceanic Administration (N) Department of Land and Resources of Guangxi Province (P) Management Division of Shankou National Mangrove Nature Reserve (L)	UNESCO-MAB (2000) Ramsar site (2002) IUCN category V NOWPAP
CHINA: Beilun Estuary National Marine	Fangcheng gang, Guangxi	2008	30,000 hm^2 (= 300 km^2, NEAMPAN)	Mangrove ecosystem(main target); 7 bird species of	Marine Nature Reserve (MNR)	State Oceanic Administration (N)	Ramsar site (2008)

[1] N: national; P: Provincial; and L: Local level
[2] Established in 1989 after the approval of Pingyang County Government, and classified as a national reserve in 1990 (http://www.chinaculture.org/gb/en_aboutchina/2003-09/24/content_21374.htm)
[3] http://www.mpatlas.org/mpa/sites/6885/
[4] http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?code=CPR+15&mode=all
[5] http://www.chinaculture.org/gb/en_aboutchina/2003-09/24/content_21374.htm
[6] http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=CPR+16
[7] Information Sheet on Ramsar Wetlands (2006-2008 version) for Shankou Mangrove
[8] Stilted Mangrove (*Rhizophora stylosa)* and Black Mangrove (*Bruguiera gymnorrhiza*)

MPA	Location	Year designated	Area	Key species or protected targets	Conservation status	Administration or management[1]	Int'l Network
Nature Reserve			*3,000 ha (Ramsar)*	global threatened listed by IUCN[9]; an important habitat in China for relic marine animals[10]		Department of Land and Resources of Guangxi Zhuang Autonomous Region (P) Fangchenggang Oceanic Administration (L)	
CHINA: National Nature Reserve of Dazhou Island Marine Ecosystems	Wanning, Hainan	1990	70 km^2 (NEAMPAN)	Swiftlet, its habitat and the marine ecological system	Marine Nature Reserve (MNR)	State Oceanic Administration (N)	IUCN Category V NOWPAP
CHINA: Sanya Coral Reef National Nature Reserve	Sanya, Hainan	1990	4,000 hm^2 (NEAMPAN) *85 km^2 (MPAglobal[11])* *85 km^2 including 24.27 km^2 of marine area (MPAtlas[12])*	Coral reef and the marine ecological system	Marine Nature Reserve (MNR)	State Oceanic Administration (N)	IUCN Category V NOWPAP
CHINA: Changyi National Marine Ecology Special Protected Area	Changyi, Shandong	2007	29.29 km^2	tamarisk (*Tamarix chinensis*), marine organisms and coastal wetland ecosystems	Marine Special Protected Areas (MSPA)	State Oceanic Administration (N)	
Japan: Shiretoko	Hokkaido Island	2005 (1964, designated as a	224 km^2	Blackiston's Fish owl *Viola kitamiana* (plant) A number of salmonid species and cetacean species	National park	Ministry of the Environment (N) Hokkaido Prefectural Government (L)	UNESCO World Heritage Site (2005)

[9] Black-faced spoonbill (*Platalea minor*) (EN), Chinese egret (*Egretta eulophotes*) (VU), Lesser white-fronted goose (*Anser erythropus*) (VU), Baikal teal (*Anas Formosa*) (VU), Baer's pochard (*Aythya baeri*) (VU), Eastern imperial eagle (*Aquila heliaca*) (VU) and Saunders's gull (*Larus saundersi*) (VU)

[10] For instance, horseshoe crab (*Tachypleus tridentatus*) and Mangrove horseshoe crab (*Carcinoscorpius rotundicauda*)

[11] http://www.mpaglobal.org/index.php?action=showMain&site_code=95655

[12] http://www.mpatlas.org/mpa/sites/2565/

MPA	Location	Year designated	Area	Key species or protected targets	Conservation status	Administration or management[1]	Int'l Network
		National Park)		Steller's Sea Lion Spotted Seals			
ROK: Suncheon Bay Tidal Flat Marine Protected Area	Suncheon-si, Jeollanam-do (South-central part of ROK)	2003	28 km^2, including mudflat 22.6 km^2 & reed field 5.4 km^2 (NEAMPAN)	Huge colony of Reed (*Phragmites communis*), and habitat of Hooded Crane (*Grus monacha*) 230 species of birds, including Hooded Crane (Natural Monument # 228) and White-naped Crane 330 species of flora, including 33 species of halophyte such as reed and *suaeda japonica* Endangered species[13]	Coastal Wetland Protected Area	Ministry of oceans and fisheries (N) Yeosu Regional Maritime Affairs & Port Administration (L)	Ramsar site (2006) IUCN Category V
ROK: Muan wetland Protected Area	Muan-gun, Jeollanam-do, ROK	2001	42 km^2 (NEAMPAN)	A total of 208 species of macrobenthos is recorded, including 70 species of polychaetes (34%), 60 molluscs, 59 crustaceans, 8 echinoderms and 11 miscellaneous taxa The most dominant species is mud mussel (*Musculista senhousia*). 49 species of winter waterbirds, including endangered and rare	Coastal Wetland Protected Area	Ministry of oceans and fisheries (N) Mokpo Regional Maritime Affairs and Port Administration (L)	Ramsar site (2008)

[13] Invertebrate: March Crab (*Sesarma intermedium*)
Migratory birds: Eurasian Spoonbill (*Platalea leucorodia*), Black-faced Spoonbill (*Platalea minor*), Bean goose (*Anser fabalis*), Wooper swan (*Cygnus cygnus*), Hooded Crane (*Grus monacha*), Baikal Teal (*Anas formusa*), Eurasian Oyster catcher (*Haematopus ostralegus*), Far Eastern Curlew (*Numenius madagascariensis*), and Saunders' Gull (*Larus saunders*)

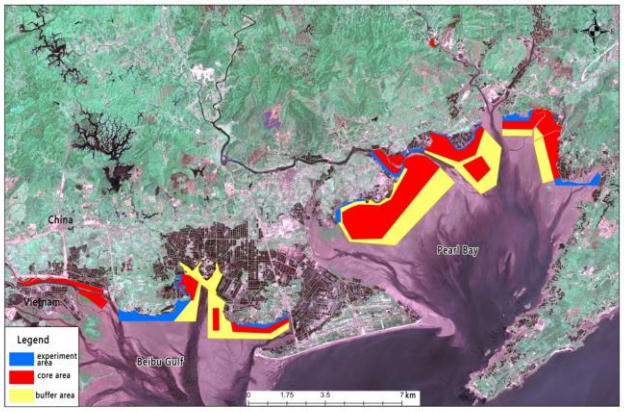
MPA	Location	Year designated	Area	Key species or protected targets	Conservation status	Administration or management[1]	Int'l Network
				spices: Saunder's Gull (*Larus saundersi*), Black-faced spoonbill (*Platalea minor*) and Chinese Egret (*Egretta eulophotes*)			
RUSSIA: Sikhote-Alin State Natural Biosphere Reserve	Terneisky and Krasnoarmeisky districts of Primorsky krai	1935 (marine area under the protection since 1991)	4,014 km^2 (including 29 km^2 of marine area)	11 species of marine mammals, including 8 in the IUCN Red List[14]; over 350 species of birds (24 species are in the IUCN Red List); 8 reptile species; 32 fish species; and 334 species of marine invertebrates	State Nature Reserves	Ministry of Natural Resources and Environment (N) Special state inspection for the protection of the Reserve (N?)	UNESCO-MAB Biosphere Reserve (1978) UNESCO World Heritage Site (2001)
RUSSIA: Far-Eastern State Marine Biosphere Reserve (FEMBR)	Southern part of Primorsky krai (the western part of the Gulf of Peter the Great)	1978	630 km^2	10 species of marine invertebrates[15]; about 60 species of birds[16]; marine mammals[17]; 62 species of plants under the category of specially protected species and in the Red Books	State Nature Reserves	Authority in transition from Far Eastern Branch, Russian Academy of Sciences (FEB RAS) to the Ministry of Natural Resources and Environment (N)	UNESCO-MAB (2003)

[14] Dall's porpoise (*Phocoenoides dalli*), Killer whale (*Orcinus orca L.*), Sakhalin sturgeon (*Acipenser mikadoi Ayres*), Sakhalin taimen (*Parahucho perryi Brevoort*), Czerski's sculpin (*Cottus czerskii Berg*), etc.
[15] 1 species of Lamp Shells (*brachiopods*), 7 species of mollusks, 2 species of *crustaceans* (a large group of arthropods)
[16] Spoonbill, Chinese egret, little Petrel, Amur bittern, white-tailed eagle, Steller's sea eagle, peregrine Falcon, black vulture, far Eastern Curlew, etc.
[17] small killer whales, porpoise, SEI whale (Evsevy whale), etc.

MPA PROFILES-CHINA

1. Beilun Estuary National Marine Nature Reserve18

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	Beilun Estuary National Marine Nature Reserve
Local name (in national language)	广西北仑河口国家级自然保护区管理处
Location	Fangchenggang, Guangxi • Guangxi Beilun Estuary National Nature Reserve is located in the north of Beilun River opposite Vietnam, and 180 km far southern to Nanning (the capital city of the province). It includes 105 km coastline, and covers 3 towns and 13 villages in Dongxing and the Fangcheng district of Fangchenggang. Latitude: 21° 31'00″ - 21° 37' 30″N Longitude: 108° 00'30″ - 108° 16'30″ E FUNCTIONAL REGIONALIZATION OF GUANGXI BEILUN ESTUARY NATIONAL NATURE RESERVE 
Site area (km²)	30,00hm² Ramsar: 3,000 ha with core area (1,406.7 ha), buffer area (1,260 ha) and experimental area (333.3ha)
Marine components (marine/intertidal/ subtidal/terrestrial)	Mangrove wetland 43% Intertidal zone tidal flat wetland 22% estuary wetland 15%

[18] Most information based on "Ramsar site_Beilun estuary_information sheet (ver.2006-2008)" (saved in H:\300-Environment\320-NEASPEC Programmes\325-Marine Protected Areas\NEAMPAN (2014~)\NEAMPAN_MPA lists)

Year of establishment	2008 (protectedplanet, Ramsar) National Nature Reserve (2000) -> Wetland Commission in Fangchenggang -> the bureau of the conserve -> public awareness and education on wetlands -> overall planning put into practice
Geographic and habitat classification	Tropical monsoon climate • Average temperature: 22°C • Annual average precipitation: 2,220 mm Protected targets: Mangrove ecosystem Coastal wetlands ecosystem Seagrass beds ecosystem
Physical features	Mountains, mesa and uplands interlace with each other, and high mountains go rolling on the land side bordering upon the reserve, while the seaward side is full of estuaries and bays, as well as amplitude tidal flats. The reserve is dominated with mangroves, and it is the place where mangroves are largely distributed in China, with a relatively higher diversity of halobios and birds. It is vital for keeping ecological equilibrium for both China and Vietnam and has important international values in wetlands conservation. Elevation: 1~2 m <u>Current land (including water) use:</u> a) within the Ramsar site: Natural mangroves, silting beach, shallow sea area are the main landuse types here. Giving priority to protection, portions of the site are the places for villagers' sporadic seining. Meanwhile, it is the important ground for wetland research and mangrove ecological education. According to functions, this site is divided into three areas as following. **Core area:** the core area includes the zone from Dudun to Hongshatou and all the mangrove tidal flats in Pearl Bay. With a great diversity and consecutive area, mangrove community's leaf canopy is regular and intertidal zone thrives there. Besides, original populations keep integrity with various kinds and halobios is rich in diversity. This area implements closed management and strictly prohibit destroying forests. **Experimental area:** cover all the mangrove tidal flats and shallow sea except those in core area. Mangrove plants are scattered, but zoobenthos are abundant. The main activities here are restoration of mangroves and some research work. **Buffer area:** act as a buffer to alleviate the detrimental effects on the mangroves and marine environment from the human activities. b) in the surroundings: Ponds and farmlands are prevailing. Aquiculture and rice cultivating are

	the main activities in the surrounding area. **Geology:** The site is composed of estuary and tidal flats in intertidal zones. The parent rocks of the silt are basalt, shale and neoteric deposits which belong to marine deposits of Holocene. The shoal here is wide and flat with a lot of shallow tidal creeks. Tidal flat soils mainly are sandy and muddy, which will be largely revealed when the tide is on the ebb. **Geomorphology:** The site has obvious characteristics of estuary and bay. The estuary is triangular like, and the bay like a semi closed circular with its mouth opposite to the south. Around the site principally are uplands and mesas. On the east, Bailong Peninsula becomes a natural barrier to withstand the wind and waves, and the shoal here is wide and flat with a lot of shallow tidal creeks. **Soil:** Mangrove marshes mostly are salting bog soils. Fine sand is the main sediment type, holding 71.8%~97.9%. Nutritive element contents in mangrove soils are not high. For example, the total nitrogen content is merely 0.693 g/kg, while the average contents of total phosphorus and total potassium are 0.226 g/kg, 9.724 g/kg respectively. One of the main reasons for this is mangrove soils' desertification. Over the coastal land there is typical red soil (latosol) with the depth of 1 to 1.5 meters and pH value from 5 to 6 and rich in organic matters. **Climate:** Located in the tropical and subtropical monsoon maritime climate region, this site is warm in spring, hot and rainy in summer, and often attacked by typhoon in fall, wet and cold in winter. The annual mean temperature in this site is 22.3°C, with average temperature 28.6°C in July, 14.1°C in January, together with the extreme lowest temperature 2.8°C. The mean annual precipitation is 2500 mm. On average, there are 147.5 rainy days per year, most of which are between June and September. The NNE and SSW wind prevails all over the year, and its average speed is 5.1 m/s. Typhoon and storm, mostly accompanied by thunder, often occur between April and September. The typhoon can bring storms and waves to assault sea coast, so it lurks huge destructive force. **Hydrology:** Diurnal tide dominates this site. The mean tidal fall is 2.25 m, and the maximum tidal fall is 4.93m. With many creeks flowing into the bay, this site has obvious estuary characteristics. **Water quality:** In the rivers of the site, the temperature of surface layer is about 29°C in summer, and 13°C in winter, and the salinity is 26‰ in summer, 28‰ in winter. Dissolved oxygen concentration ranges from 5.99 mg/L to 7.66 mg/L, with an average of 7.07 mg/L. The pH value is increasing from the estuary to the top of the bay, finally up to bay mouth, with an average value of 7.86. As sea water dominates this tide, the influence of fresh water on runoff is small. The key pollution indicators such as potassium permanganate index, BOD, and ammonia nitrogen were decreasing, while petroleum was increasing from 2001 to 2004. The mean contents of TN, TP, and petroleum are 0.22 mg/L, 0.0046 mg/L and 0.040 mg/L respectively, while the mean COD is less than 2.0

	mg/L. Catchment area: 1,672 km^2 Rivers in the catchment: Beilun River, Jiangping River, Luofu River, etc.
Conservation status	Region jurisdiction: Fangchenggang Oceanic Administration Function jurisdiction: State Oceanic Administration of China Superior administrator: the Department of Land and Resources of Guangxi Zhuang Autonomous Region Land tenure/ownership: - Within the Ramsar site: State owned - In the surrounding area: State owned. The local community uses the surrounding land.
Regulatory frameworks	
Administration Responsible ministry or agency	Region jurisdiction: Fangchenggang Oceanic Administration Function jurisdiction: State Oceanic Administration of China
Management Management authority	Guangxi Beilun Estuary National Nature Reserve Management (Ramsar)
Legal framework Name of the law/regulation	REGULATIONS OF THE PEOPLE'S REPUBLIC OF CHINA ON NATURE RESERVES
Monitoring and Research	Ecological monitoring, bird observation, mangrove insect pests, plant culturing and ecological conservation in technical cooperation with Guangxi Mangrove Research Center, Breeding and recovery of rare species living in mangroves and coastal wetlands, sea water chemical analysis and ecological investigation
Key stress / managerial issues	Within the Ramsar site: aquaculture exerted a certain strain to the reserve formerly, but now is under control as the reserve founded In the surrounding area: aquaculture and agriculture might cause some potential impact
Key stakeholders involved in management	
Relevant network (international programmes)	Ramsar site
Reference in MPA database	
NOWPAP database[19]	Not included
Protected planet[20]	Guangxi Beilun Estuary National Nature Reserve (WDPA ID: 109011)

[19] http://dinrac.nowpap.org/NowpapMPA.php
[20] http://protectedplanet.net

	(http://www.protectedplanet.net/sites/Guangxi_Beilun_Estuary_National_Nature_Reserve_Ramsar_Site_Wetland_Of_International_Importance)
MPA global[21]	Not included
Others	Ramsar Site (no. 1728) as Guangxi Beilun Estuary National Nature Reserve (https://rsis.ramsar.org/ris/1728)
Purposes and reasons of its nomination as target MPA	
Contact point for NEAMPAN	Mr. Su Bo (苏搏) Director Guangxi Beilun Estuary Nature Reserve (广西北仑河口自然保护区，主任) Telephone：+86-18077030066 Email: 152747159@qq.com

MPA Profile 2

Item	Detail
Naturalness[22]	- the extent to which the area has been protected from, or has not been subject to human-induced change
Biogeographic importance[23]	- rare biogeographic qualities - representative biogeographic type(s) - any unique or unusual geological features
Ecological importance[24]	Mangrove forest as well as intertidal mudflats located on the Belium River, the boundary river between China and Viet Nam, which also lies on the East Asian - Australasian Flyway. Semi closed bays, open estuary coasts, sandy beaches with mangrove vegetation provide habitat for 187 bird species including IUCN Red-List vulnerable and endangered species like Heilianpilu (*Platalea minor*), Huangzuibailu (*Egretta eulophotes*), Qingtouqianya (*Aythya baeri*), and Heizuiou (*Larus saundersi*), and 240 species of large zoobenthos, 255 species of birds, and more than 1,400 species of higher plants. It is also an important habitat in China for relic marine animals such as *Tachypleus tridentatus*, and *Carcinoscorpius rotundicauda*.

[21] http://www.mpaglobal.org
[22] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[23] *Ibid.*
[24] *Ibid.*

	The wetland is one important stopover site of the flight routes of migrant birds which migrate between north east and south eastern Asia, and between Malaysia and Australia. There is a sea grass community at the low shore region of the mangroves. Moreover, an investigation in 2004 found that there exists a massive area of coral reefs in the reserve's offshore area. There are 96 species listed in the "Sino-Japanese Agreement on the Protection of Migratory Birds and Their Habitats" (ex. Platalea minor and Anas Formosa) and 45 species on the protected list by the "Sino-Australia Agreement on the Protection of Migratory Birds and Their Habitats". The reserve supports 11 true mangrove species and 7 semi-mangrove species. It is the largest contiguous stretch of mangroves in China. It is rare that there are many mangrove plants growing on the tidal flat under average sea level in Pearl Bay within the site, while in the periphery low tide region, there grows *Zostera marina* sea grass community. Also the reserve is the only site where *Heritiera litoralis* forest grows on the coastal region in Guangxi Province. The mangrove ecosystem plays a substantial role in shoreline protection by alleviating flood caused by typhoon and resisting the impact of tides. 13 bird species of global threatened listed by IUCN Platalea minor– IUCN (EN), CMS (Appendix I), Class of national protected animal (II) Egretta eulophotes– IUCN (VU), CMS (Appendix I), Class of national protected animal (II) Anser erythropus - IUCN (VU), CMS (Appendix I/II) Anas Formosa - IUCN (VU), CITES (II), CMS (Appendix I) Aythya baeri9 - IUCN (VU) Aquila heliaca - IUCN (VU), Class of national protected animal (II) Larus saundersi - IUCN (VU) Eurynorhynchus pygmeus - IUCN (CR) Numenius madagascariensis - IUCN (VU) Tringa guttifer - IUCN (EU), CITES (I), Class of national protected animal (II) Pitta nympha- IUCN (VU), CITES (II), Class of national protected animal (II) Emberiza aureola - IUCN (EU) Gorsachius magnificus- IUCN (EU), Class of national protected animal (II)

	The site is a significant place for halobios' reproduction, migration, foraging, breeding and inhabiting. The mangrove's tidal creeks are vital places for female limulus to reproduce, while infants of limulus scatter on mangrove's tidal flats. The ancient relic species *Lingula anatina* can be found frequently on bare beach at the edge of mangroves. The mangrove stands are the foremost habitat for many economic fishery species. **General ecological features**: In this site, the key habitats are the semi-closed bays and open estuary coasts, as well as large intertidal zone tidal flats and sandy beaches, together with some shallow sea and rock coasts. The typical vegetation in the reserve is mangrove, while on the maritime space around the forest and intertidal zones there are seaweed beds and coral reefs. Pearl Bay is a typical semi-closed funneled bay, communicating with Beibu Bay on the southern mouth. The width of the bay mouth is about 3.5km. Within this bay, wind and waves are not so violent that the tidal flats are planar and open. Adding on Jiangping River and Huangzhu River's inflow, this site provides favorable habitats for mangrove plants' growth. *Bruguiera gymnorhiza, Kandelia obovata, Aegiceras corniculatum* and *Aricennia marina* are the principal mangrove species in this site, and they are the constructive and dominant species in most mangrove communities. While *Excoecaria agallocha, Acrostichum aureum* and *Acanthus ilicifolius* can be constructive and dominant species in the small mangrove plant community on the shoals of Beilun estuary and Jiangping estuary. Other species scatter on the site, not forming an obvious community. There are plenty of fishes and zoobenthos living in the mangrove wetland that it becomes a significant site for birds to forage and inhabit. Also as one of the hot spots of regional biodiversity, this site sustains vulnerable, endangered and critically endangered species or threatened ecological communities. Locating on the passages where migrant birds flight between northeast and southeastern Asia, together between Malaysia and Australia, the wetland is a vital breeding place for water birds. Around the wetland there are some shrimp ponds, farmlands and villages, as well as 100-500 m width forest belt along the coast and act as inhabits for some water birds such as egrets. **Noteworthy flora:** Mangrove is the main natural plant community in the site, while *Zostera marina* sea grass community flourishes in the mangrove's periphery low tide region in Pearl Bay. Some main

	communities are as follow: (1) *Aricennia marina* formation: Universally distributed in the site. The height ranges from 1.0 m to 2.5 m, and the coverage is about 40%-90%. In muddy habitat of middle inner beach, *Avicennia marinas* develops well enough to a 2.5 m height with obvious trunks, and their basal diameter can reach 18 cm, while in other habitats, they grow worse and branch at the neck of roots, shaping of shrub. (2) *Kandelia candel* formation: Popularly distributed, often appears from middle beach to middle outer beach, where soils are semi-sediments. The community takes on a turquoise color, with the height of 1.8-2.5 m and the coverage is about 60%-85%. Whereas those often lopped are shaping of shrub with height of 1.0-1.5m. The predominantly species is *Kandelia candel*, which has undeveloped buttress roots. And the companion species are *Aegiceras corniculatum* and *Avicennia marina*. (3) *Excoecaria agallocha* formation: They usually grow along the high tide mark. Those often lopped are shaping of shrub with height 0.8-6 m and coverage 30%-50%. The predominant species is *Excoecaria agallocha*, but on partial beach locations there are *Kandelia candel*, *Aegiceras corniculatum* and some other species. The community structure is single or double layered. (4) Seaweed community: Seaweed community mainly distributes on sandy and muddy low tidal zone in Pearl Bay, and mostly focuses on the tidal beach. The community's color is aqua and the dominant species is *Zostera japonica.* (5) *Heritiera littoralis* community: The area of this rarely semi-mangrove community in the site is about 4.3 ha. Three large *Heritiera littoralises* trees have been found on Shanxin Island, one of which is the highest in Guangxi. It is 13.6 m high and its diameter at breast height is 81 cm, and its buttress root reaches 1.7 m. **Noteworthy fauna:** There are 124 macro-zoobenthos species (under 94 genus) in the site, including 27 polychete species (under 24 genus), 48 mollusk species (under 34 genus), 35 crustacean species (under 23 genus), 1 echinoderm species (under 1 genera), 5 zoobenthos fish species (under 5 genus) and other 8 species (under 7 genus); and there are 46 zooplankton species (under 33 genus) found in the site. There are 34 fish species, 255 bird species (belonging to 49 families of 16 orders respectively) recorded in the site, and some of them are globally threatened species provided in section no 14. The site is not only one of the habitat rich in zoobenthos, but also a very important habitat for relic marine animals, such as

	Lingula anatine, which belongs to first protection class in China, *Tachypleus tridentatus* and *Carcinoscorpius rotundicaudu*, belong to second protection class, are very common in the site, and means a lot in preserving relic marine inheritance and biodiversity.
Economic importance[25]	The site plays a substantial role in shoreline protection, alleviating floods caused by typhoons and resisting the tide's impacts. Sand beach, sunlight and sea water converge at this site, it also attracts 20 minorities living here, such as Gin nationality. The charming beach, splendid minorities' culture, abundant biodiversity make it an attractive sightseeing place. The mangroves in the Reserve can resist the impingement of waves, tides and floods. It can also effectively alleviate the damage caused by typhoons, violent tides and tsunamis. It also has functions in protecting coastlines and reclaiming lands from the sea. - existing or potential contribution to economic value by virtue of its protection (ex. protection of an area for recreation, use by traditional inhabitants, appreciation by tourists and others)
Social importance[26]	Three visitor centres have been built for education and training purposes, especially for the school students. **<u>CEPA activities</u>** Beilun Estuary National Nature Reserve Visitors' Center was put into service in 2013. Since then, a lot of educational activities have been carried out. We gave lectures on mangrove to primary and middle school students, residents and officers once a year. Since 2004, undergraduate and graduate students' exercitation and training have been in process. So far, the reserve has become the practical base for life science for Guangxi Normal University. In 2015, we had made or issued 8,000 booklets of 3 kinds, 8,000 posters of 3 issues, 20 news reports. The Center also contains a specimen show hall, a multimedia propagandize hall, offices and some related facilities. Social and cultural values: The mangrove wetland in Beilun Estuary has particular significance in scientific research, cultural education, touring, community service and environmental

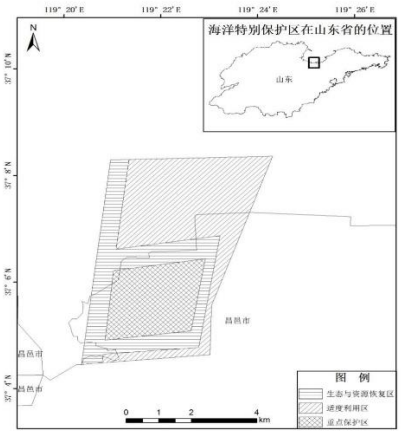
[25] *Ibid.*
[26] *Ibid.*

	monitoring, and has great influences on the development of marine fishery, livestock farming and agriculture. The main activities here are prawn, fish and shellfish culture, and act as an important income to the native residents, such as Gin nationality. A visitor center has been built for natural education and training, and it became an education base for primary and middle school students. Tourism had not been organized yet. (RIS)
Scientific importance[27]	<u>Scientific research and facilities</u> • Ecological monitoring, bird observation, mangrove insect pests, plant culturing and ecological conservation in technical cooperation with Guangxi Mangrove Research Center, Institute of Botany, the Chinese Academy of Sciences and Guangxi Normal University • Breeding and recovery of rare species living in mangroves and coastal wetlands, with Guangxi Normal University since 2005 • Bird observation with Guangxi Normal University since 2000 • GEF Project: Reversing Environmental Degradation in the South China Sea and Gulf of Thailand • The environmental monitoring laboratory established by Fangchenggang Oceanic Administration and the reserve for sea water chemical analysis and ecological investigation since 2002 - value for research and monitoring
International or national significance[28]	Any potential to be listed on the World or a national Heritage List or declared as a Biosphere Reserve or included on a list of areas of international or national importance is the subject of an international or national conservation agreement
Practicality/feasibility[29]	- Degree of insulation from external destructive influences - Social and political acceptability - Degree of community support - Accessibility for education, tourism, recreation compatibility with existing uses, particularly by locals - Ease of management - Compatibility with existing management regimes

[27] *Ibid.*
[28] *Ibid.*
[29] *Ibid.*

2. Changyi National Marine Ecology Special Protected Area

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	Changyi National Marine Ecology Special Protected Area
Local name (in national language)	昌邑国家级海洋生态特别保护区
Location	Changyi, Shandong Latitude: 37°04′25.74″N-37°08′15.47″N Longitude: 119°20′09.30″E-119°24′13.21″E 
Site area (km²)	2,929.28 ha (=29.29 km²)
Marine components	Marine, intertidal, subtidal, terrestrial
Year of establishment	November, 2007
Geographic and habitat classification	Climate: temperate monsoon Wide stretch of muddy flat and many benthic animal community species; Rich vegetation and diversity of animal resources; Fertile water and abundant nutrients.
Physical features	Flat topography and accumulational coastal plain, irregular and mixed semidiurnal tide, flood current of SW and ebb current of NE, low salinity of 30, five main rivers to sea including Yu river, Di river, Wei river, Pu river and Jiaolai river.
Conservation status	Present ownership：Changyi Ocean and Fisheries Bureau Conservation status: Fair Threat: tamarisk's natural range with 2070 ha, threats because of development and utilization activities;

Regulatory frameworks	
Administration Responsible ministry or agency	State Oceanic Administration URL: http://www.soa.gov.cn/
Management Management authority	Management Committee of Changyi National Marine Ecology Special Protected Area
Legal framework Name of the law/regulation	Marine Environmental Protection Law of the People's Republic of China; Regulation of Marine Special Protected Area Management; Guidelines for the Standardized Management and Construction of MPA
Monitoring and Research	Marine ecosystem monitoring has been carried out in annual May and August; The protected area has cooperated with Ocean University of China, the First Institute of Oceanography, Qingdao National Oceanography Laboratory and other scientific research institutes; It has been the demonstration zone of two marine non-profit scientific research; Scientific research institute of marine ecology and engineering in Changyi was established by the protected area and the Cold and Arid Regions Environmental and Engineering Research Institute of the Chinese Academy of Sciences.
Key stress / managerial issues	Inadequate Management/Protection Capacity; Insufficient funds; More attention on exploitation rather than protection; Lack of awareness on the marine environmental protection.
Key stakeholders involved in management	Liutong Town Government, Zaohu Salt Chemical Co., Ltd., Hongchang Chemical Co., Ltd., Weichang Chemical Co., Ltd., Bohai Rim Aquaculture Co., Ltd., Beihai Aquaculture Co., Ltd.
Relevant network（相关的网络、国际课程） (international programmes)	NEAMPAN
Reference in MPA database	
NOWPAP database[30]	Changyi Seacology National Marine Special Reserve (http://dinrac.nowpap.org/NowpapMPA/NowpapMPA_form_detail.php?id=145)
Protected planet[31]	Not included

[30] http://dinrac.nowpap.org/NowpapMPA.php
[31] http://protectedplanet.net

MPA global[32]	Not included
Others	Not included
Purposes and reasons of its nomination as target MPA	Have a Management Authority, National Level of MPA, English Communication Skills, Take the biodiversity, rare and endangered species as the main protected target.
Contact point for NEAMPAN	

MPA Profile 2

Item	Detail
Naturalness[33]	- 2929.28ha, from dam near to salt pans to Di river, as far north as aquiculture area in shallow sea
Biogeographic importance[34]	- Tamarisk's natural range with 2070 ha which own good growth; - Shallow sea, tideland, saltmarsh, tamarisk wetland - Has the largest area and typical structure in China coast - Flat topography and accumulational coastal plain
Ecological importance[35]	Protected targets: Tamarix chinensis, marine organisms and coastal wetland ecosystems - Essential ecological processes or life-support systems (ex. source for larvae for downstream areas) - The degree to which the area either by itself or in association with other protected areas, encompasses a complete ecosystem - A variety of habitats - Habitat for rare or endangered species - Feeding, breeding or rest areas - Rare or unique habitat for any species - Genetic diversity - Protected targets: Tamarix chinensis, marine organisms and Coastal wetland ecosystems - Maintain and protect marine and costal ecosystem, marine biodiversity, conserve soil and water, prevent coastal erosion - Improve fragile ecosystems of Laizhou Bay - Tamarisk's natural range with 2070 ha; - Be rare among the north coast and has been of inestimable

[32] http://www.mpaglobal.org
[33] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[34] *Ibid.*
[35] *Ibid.*

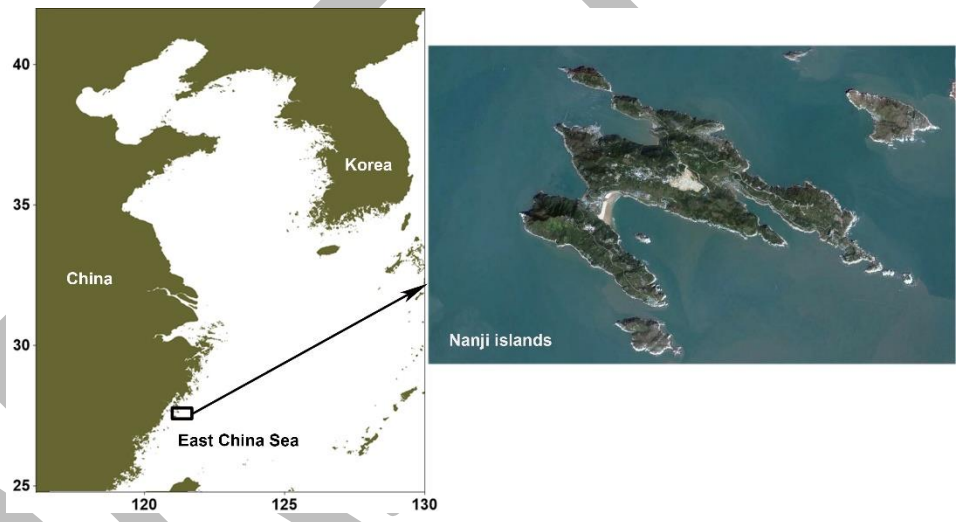
	value to protection and development - Contain many species, there are Reed, Suaeda heteroptera, Limonium bicolor and other plants; wild animals such as Foxes and Hares habitat here; there are a lot of large bentonic organism such as Mactra veneriformis, Moerella irideseens, Razor shell, Bullacta exarata
Economic importance[36]	- Take advantage of the local rich brine resources to develop salt chemical - Develop bottom sow and enhancement in intertidal and perform moderately fishing activities of major economic fish and shrimps of in subtidal - Arrange reasonably residents near the protected areas to the post of protection - With the development of ecological tourism, the opportunity of work and income of the local will increase - Cultivate Tamarix widespread to provide develop an area for appreciation by tourists, which has the contribution to economic benefit of the protected areas - Recreation with local characteristics, farm feast, farm guesthouses and other popular projects will increase personal incomes
Social importance[37]	- Infrastructure in the protected and surrounding areas could be built perfectly - Reserve sand and improve embankment while ensure the safety of facilities - Become the important base of education and awareness on Tamarix resources of costal wetland
Scientific importance[38]	- Value for research and monitoring - Tamarix resources could be maintained and protected perfectly - Resources of the costal wetland ecological system could be sustainable utilization - Research on grafting with Tamarix and Cistanche could add the value of Tamarix in the field of medicine
International or national significance[39]	- Marine ecosystem in protected areas is representative in Laizhou Bay of the Bohai sea - It's tamarisk's natural range which own good growth, the largest area and typical structure in China coast - It's extremely rare among the north coast and has been of inestimable value to protection and development
Practicality/feasibility[40]	- Establish a special group of management and protection to

[36] *Ibid.*
[37] *Ibid.*
[38] *Ibid.*
[39] *Ibid.*
[40] *Ibid.*

	strengthen inspection and protection of the protected areas - The Management Committee of Changyi National Marine Ecology Special Protected Area was licensed in 2009. It belongs to the public institution and controlled directly by the city government - Establish regimes such as Rules and Regulations of Changyi National Marine Ecology Special Protected Area, Fire prevention plans of Changyi National Marine Ecology Special Protected Area - Improve constantly the regimes of using the sea areas in paid and ecological compensation system, drum up funding for vegetation restoration, vigorously implement the protection and restoration of tamarisk and costal wetland ecological system, take measures of limiting construction, artificial plant, enhance promotion and inspection to expand the area of tamarisk and rescue the marine ecological system around the area gradually.

3. Nanji Islands National Marine Nature Reserve 41

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	Nanji Islands National Marine Nature Reserve
Local name (in national language)	南麂列岛国家海洋自然保护区
Location	Nanji Islands locates at the Southeast of Pingyang, Zhejiang, 56 km away from Aojiang Port of Pingyang County and about 150 km away from the Taiwan Island. The reserve ranges from 27°24'30'' N to 27°30'00'' N and from 120°56'30'' E to 121°08'30'' E, its center is located at 27°27''N, 
Site area (km²)	201.06 km², including 190.71 km² of sea waters
Marine components	Intertidal zones are the main protected areas.
Year of establishment	It was established in 1989 after the approval of Pingyang County Government, classified as a national reserve in 1990, and classified as a Biosphere Reserve in 1998.
Geographic and habitat classification	Nanji Islands National Marine Nature Reserve has unique ecological environment, diverse species and complex fauna due to its location in the confluence of Taiwan warm current and Zhejiang coastal current. Marine shellfish and algae as well as their habitats are the main protected targets. This was the first marine/coastal biosphere reserve in China. Coastal/marine area with 52 islands larger than 500 m², with rocky, sandy and silty zones. The 28 km long coastline consists of exposed bedrock and sharp cliffs, bays and islets. The biosphere reserve offers a multitude of diverse marine habitats which host a rich number of

[41] http://www.chinaculture.org/gb/en_aboutchina/2003-09/24/content_21374.htm

	shellfish and algae species. Fifteen of the identified 403 species of shellfish have been found only in the Nanji waters. The shellfish and algae are intermittently distributed in the tropical and temperate marine realms, which makes this species-rich site even more important for conservation and scientific research. These species are concentrated in the core areas, which consist of two islets and a portion of Nanji Island and their surrounding waters.
Physical features	Nanji Island is the biggest island of the Reserve, with an area of 7.64 km2, and that's why the Reserve was named after it. The Reserve lies in the transitional part of temperate and tropical zones, and its location is in a coastal area where the Taiwan warm current and Jiangsu-Zhejiang coastal current fluctuate in alternation. Climate of the region is oceanic monsoon climate, so it is surface water temperate without being too hot in the summer and too cold in the winter with average annual temperature 16.5 ℃. The average temperature of the surface water is 18.7 (5.7-32.1) ℃, and the average salinity is 30.5 (28.8-33.5). Most parts of the Reserve are washed and eroded by seawater, and the coastline there is tortuous. The Nanji Island is a bedrock island mainly composed of 23 islands and 14 hidden reeves and 55 reeves. The highest peak of the Nanji Island is 229 m above sea level, the maximum water depth of the surrounding waters is 45 m. Each island in the Reserve has its own feature. For instance, Dalei Island and Bamboo Island are called Islands of Narcissus for many narcissus make home there. Besides, there are Island of Snakes and Island of Birds, etc. The Nanji Island is surrounded by 5 capes including Longzuitou Cape, 3 bays including Mazu'ao Bay and Nanji Port. There is a shellfish sea beach along the island, 800 m wide and 600 m long. Nanji Islands are far away from the mainland and the seawater there is limpid and transparent that one can see 5 m deep into the water. Rocks washed and eroded by waves for a long period of time make up a picturesque landscape of cliffs, pillars, caves and terraces. They are appraised as fairy hills over blue sea.
Conservation status	The key challenges in Nanji Islands National Marine Nature Reserve include coralline algae bloom, red tide, poaching and typhoon.
Regulatory frameworks	
Administration Responsible ministry or agency	The State Ocean Administration The Environmental Protection Bureau of Zhejiang Province, The comprehensive supervising and inspecting department, the Nanji Islands Nature Reserve Administration (UNESCO-MAB) URL: http://www.njld.org/index.aspx
Management Management authority	Nanji Islands Nature Reserve Administration includes 6 departments: office, marine surveillance section, planning and construction department, scenic management office, maritime surveillance detachment and scientific research department. URL: http://www.njld.org/Col/Col18/Index.aspx

Legal framework Name of the law/regulation	"Regulations of the People's Republic of China on Natural Reserves", "Marine Environmental Protection Law of the People's Republic of China", "Regulations of Zhejiang Province on the protection of the marine environment", "Zhejiang province Nanji Islands National Marine Nature Reserve Management Regulations" and "Fishery Law" URL: http://www.njld.org/Col/Col49/Index.aspx
Monitoring and Research	Nanji Islands are known as "the kingdom of shellfish and algae", also known as "the museum and gene bank of marine organisms in the north and south China. 1876 species of marine organisms, including 178 species of algae, benthic micro algae, 427 species of shellfish, 459 species of crustacean and 257 species, 397 species of fish and other sea creatures 158, have been identified in Nanji Islands in marine biological resources investigations over years. Especially, shellfish and algae resources are very rich, respectively accounting for about 15% and 25% of the total number in China, and they altogether accounting for 80% of the total number in Zhejiang province. URL: http://www.njld.org/Col/Col27/Index.aspx
Key stress / managerial issues	The key challenges in Nanji Islands National Marine Nature Reserve include coralline algae bloom, red tide, poaching and typhoon. The main activities in Nanji Islands are fish production and trade, while tourism is becoming more and more important, with approximately 100,000 tourists per year (2014). Due to large-scale collection and harvesting in the past few decades, the marine and terrestrial life is degraded to various degrees and therefore one of the management challenges is to restore and protect these resources.
Key stakeholders involved in management	- Pingyang County Government, http://www.zjpy.gov.cn/; - Zhejiang Province Ocean and Fishery Bureau, http://www.zjoaf.gov.cn; - Local community; - Tourists; etc.
Relevant network (international programmes)	UNESCO-MAB Biosphere Reserve (July 1998)
Reference in MPA database	
NOWPAP database[42]	Not included
Protected planet[43]	Nanji Islands UNESCO-MAB Biosphere Reserve (WDPA ID: 168197) (http://www.protectedplanet.net/sites/Nanji_Islands_Unescomab_Biosphere_Reserve)
MPA global[44]	Not included

[42] http://dinrac.nowpap.org/NowpapMPA.php
[43] http://protectedplanet.net
[44] http://www.mpaglobal.org

Others	MPAtlas: Nanji Islands UNESCO-MAB Biosphere Reserve (http://www.mpatlas.org/mpa/sites/6885/)
Purposes and reasons of its nomination as target MPA	Protected targets: marine shellfish and algae as well as their habitats
Contact point for NEAMPAN	No.74 Middle Xingao Road, Aojiang Town, Pingyang County 325401, Zhejiang Province, China Telephone: (86) 0577-63261608 Fax: (86) 0577-63261600 E-mail: njld1991@tom.com Web site: www.njld.org

MPA Profile 2

Item	Detail
Naturalness[45]	The extent to which the area has been protected from, or has not been subject to human-induced change
Biogeographic importance[46]	Nanji Islands National Marine Nature Reserve has unique ecological environment, diverse species and complex fauna due to its location in the confluence of Taiwan warm current and Zhejiang coastal current. The shellfish and algae are intermittently distributed in the tropical and temperate marine realms, which makes this species-rich site even more important for conservation and scientific research.
Ecological importance[47]	Favourable climate, special hydrologic and physical features result in a unique ecological system and wildlife species. The Reserve is especially rich in sea life. 403 species of shellfish has been identified in Nanji Islands, among them, 19 were reported first in China; 174 species of seabed algae, of which an algae species is newly discovered in the world. These species account for more than 20% respectively of total shellfish and algae in China. The shellfish and algae are not only abundant, but also have fauna and geographical disjunction characteristics of temperate and tropical zones; therefore, the Reserve is called important species database of shellfish and algae. In addition, in the Reserve there are 368 species of fish and 180 species of shrimps and crabs such as precious abalones and groupers, as well as 317 terrestrial seed plants and 55 vertebrates.

[45] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[46] *Ibid.*
[47] *Ibid.*

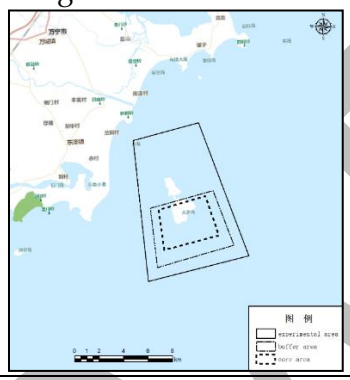
Economic importance[48]	The main incomes of local community in Nanji Islands are fishery and tourism, and the tourism is becoming more and more important, with approximately 100,000 tourists per year (2014). Due to large-scale collection and harvesting in the past few decades, the marine and terrestrial life is degraded to various degrees and therefore one of the management challenges is to restore and protect these resources. One attempt to decrease the damage caused by this random collection and harvesting consists of demonstration projects established to promote aquaculture. Other efforts will be made to conduct breeding and culture of young shellfish and algae.
Social importance[49]	Nanji Islands Natura Reserve exists as an education center of marine biodiversity in local and national communities. And a new marine research and education center is building in Nanji Islands.
Scientific importance[50]	Nanji Islands Nature Reserve lies in the transitional part of temperate and tropical zones, and its location is in a coastal area where the Taiwan warm current and Jiangsu-Zhejiang coastal current fluctuate in alternation. Thus, the ecological environment, species diversity and complex fauna are unique in Nanji Islands and make it important in Scientific research.
International or national significance[51]	Nanji Islands are known as "the kingdom of shellfish and algae", also known as "the museum and gene bank of marine organisms in the north and south China for its abundant and diverse shellfish and algae resources.
Practicality/feasibility[52]	- Nanji Islands Nature Reserve is far away from the mainland as well as the industrial pollution; - The government and society gradually wared of the importance of environmental protection with China's economic development. In this situation, Nanji Islands Natural Reserve was established in 1989 after the approval of Pingyang County Government, and then classified as a national reserve in 1990. - Degree of community support - Nanji Islands Natura Reserve exists as a center of tourism, entertainment and education of marine biodiversity in local communities. Every year approximately 100,000 tourists come to Nanji Islands. - The interests of local communities are closely related to the ecology and biology resources in Nanji Islands, and the reserve provides benefits and contributions to the local

[48] *Ibid.*
[49] *Ibid.*
[50] *Ibid.*
[51] *Ibid.*
[52] *Ibid.*

	communities. - Nanji Islands Nature Reserve Administration conducts all its protection under the current legal framework.

4. National Nature Reserve of Dazhou Island Marine Ecosystems

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	National Nature Reserve of Dazhou Island Marine Ecosystems
Local name (in national language)	大洲岛海洋生态国家级自然保护区
Location	Wanning, Hainan Latitude: 18°37′06″N-18°43′54″N Longitude: 110°26′50″E-110°32′06″E 
Site area (km²)	7,000 hm² (=70 km²)
Marine components	Marine/intertidal/subtidal
Year of establishment	1990
Geographic and habitat classification	- Climate: tropical monsoon; - Hainan Swiftlet and other swifts inhabit and breed here without seasonal migration; - Be abundant of wild animals and plant resources in the island; - Natural plants have good growth and have over 95 percent coverage including four vegetation types which are groundling, grassland, brush and low forest; - Contain amphibians, reptiles, birds and mammals in the island; - Be rich in marine living resources with high biodiversity; - Coral reef has a large distribution.
Physical features	- Dazhou Island is based on continental shelf and belongs to the continental island away from the coast; - Most of the seabed is reef and sandy floor besides little sand, which provides good conditions for coral and other creatures liked the reef; - Typical submarine geomorphy; - The prevailing flow is southern wind while it is northern wind in winter; - Mixed wave of wind and swell; - Irregular and mixed diurnal tide;

	- It is conducive to the formation of fishing grounds that Qiongdong upwelling causes the gather of fishes;
Conservation status	- Present ownership：Hainan Provincial Department of Ocean and Fisheries; - Conservation status: Fair; - Threat: Unreasonable fishery production has bad effect on marine fisheries; Informal tourist activities could destroy the marine ecological environment.
Regulatory frameworks	
Administration Responsible ministry or agency	State Oceanic Administration; Hainan Provincial Department of Ocean and Fisheries URL: http://www.soa.gov.cn/; http://dof.hainan.gov.cn/
Management Management authority	Administrative Office of National Nature Reserve of Dazhou Island Marine Ecosystems
Legal framework Name of the law/regulation	- Marine Environmental Protection Law of the People's Republic of China; - Regulation of Marine Special Protected Area Management; - Guidelines for the Standardized Management and Construction of MPA.
Monitoring and Research	- Hainan Development Planning Design Institute, Hainan Normal University and Hainan University carry out a series of studies such as study on behavioral ecology and species of swiftlet, research on biodiversity of plants in the island and marine ecology around the island; - Marine seawater monitoring annually; - In 2008, biology resources investigation had been carried out in Dazhou Island protected area.
Key stress / managerial issues	- Inadequate capacity in management / protection impacts the effect of the work; - Insufficient funds, rotten infrastructure, poor capacity of research and monitoring cause that management and protection couldn't be implemented as well;
Key stakeholders involved in management	Xinqun Village
Relevant network (international programmes)	NEAMPAN
Reference in MPA database	
NOWPAP database[53]	Not included
Protected planet[54]	Dazhoudao Nature Reserve (WDPA ID: 95665)

[53] http://dinrac.nowpap.org/NowpapMPA.php

	(http://www.protectedplanet.net/sites/Dazhoudao_Nature_Reserve)
MPA global[55]	Dazhoudao (http://www.mpaglobal.org/index.php?action=showMain&site_code=95665)
Others	IUCN category V
Purposes and reasons of its nomination as target MPA	Have a Management Authority, National Level of MPA, English Communication Skills, Take the biodiversity, rare and endangered species as the main protected target.
Contact point for NEAMPAN	

MPA Profile 2

Item	Detail
Naturalness[56]	70 km², including 65.8 km² of marine portion, located in the town of Dong'ao
Biogeographic importance[57]	- Protected targets: Swiftlet, its habitat and the marine ecological system - It is the largest of the islands and the unique habitat island of Swiftlet in China - The island is granite formations and many caves Swiftlet lived in were formed after a long time washing by the sea - Large amount of algae and fish in the marine provide the swiftlet enough food - Qiongdong upwelling bring many nutrients for the marine creatures to the surface so that the area provides a place of seeking, breeding and migrating
Ecological importance[58]	- Typical marine ecosystem of the Island with abundant of plants and animal resources, especially the Swiftlet - Swiftlet has been the endangered species and Dazhou Island provides them habitat environment - Swiftlet' s nests are famous and called Eastern curiosity and rare medicine - Maintain the diversity of marine organism and reach the sustainable utilization of marine resources
Economic importance[59]	- Take advantage of the abundant resources and beautiful

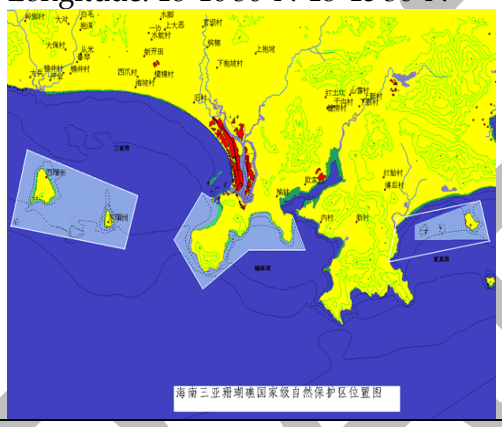
[54] http://protectedplanet.net
[55] http://www.mpaglobal.org
[56] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[57] *Ibid.*
[58] *Ibid.*
[59] *Ibid.*

	sightseeing to develop ecological tourism - Deliver projects about leisure fishery and holiday village to support the adjustment of industrial structure in community - Improve swiftlets' nest and fishery products to create their own characteristic - Arrange reasonably residents near the protected areas to the post of travel companies or protection of natural reserve
Social importance[60]	- Strengthen the understanding of the public on the swiftlet and marine protected areas to develop awareness of protection - Preserve the folk culture of the island
Scientific importance[61]	- Have important significance on research the rare swiftlet and its habitat - Have great effect on researching the faunas and protecting species diversity
International or national significance[62]	- Hainan Swiftlet is a new geographic subspecies in Southeast Asia - It is the rare swiftlet in the north that can produce a kind of white and edible nest
Practicality/feasibility[63]	- In 1992, Administrative Office of National Nature Reserve of Dazhou Island Marine Ecosystems was established - A series of regulation has been made such as management of scientific research and teaching experience in marine natural reserve and approval process of appropriate development - The boundary markers and patrol boat and a few other rotten Infrastructures have been built - Has got success in promotion and got the support of local government and people - Carry out primary scientific research and monitoring activities

[60] *Ibid.*
[61] *Ibid.*
[62] *Ibid.*
[63] *Ibid.*

5. Sanya Coral Reef National Nature Reserve

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	Sanya Coral Reef National Nature Reserve
Local name (in national language)	三亚珊瑚礁国家级自然保护区
Location	Sanya, Hainan Latitude : 109°20′50″E-109°40′30″E Longitude: 18°10′30″N-18°15′30″N 
Site area (km²)	• MPA global: 85 km² • MPA tlas: 24.27 km² of marine area, 85 km² of area • 85 km² with core zone, buffer and experimental zones
Marine components	Marine/intertidal/subtidal
Year of establishment	1990
Geographic and habitat classification	- Protected targets: Coral reef and the marine ecological system; - Include the coast of Luhuitou Peninsula, Dongmaozhou, Ximaozhou, Yalong Bay; - Being the important area to protect the diversity of marine organism with high primary productivity and abundant Biological resources; - Differences in geomorphology are evident between the eastern, the western and the middle part; - The eastern and western parts are typical island and the other is a peninsula with lots of capes and bays.
Physical features	- Salinity: 33.4~33.8 ‰ - Water temperature: 23.6~29.3°C - Small waves damaging effects, full water exchange, shallow water, pollution, rich in organic matter content, hard matrix are good for coral growth.
Conservation status	- Present ownership: Hainan Provincial Department of Ocean and

	Fishes - Conservation status: Fair; - Threat: Excessive digging couldn't be banned; - Human activity has broken the marine ecological balance;
Regulatory frameworks	
Administration Responsible ministry or agency	State Oceanic Administration, Hainan Provincial Department of Ocean and Fishes URL: http://www.soa.gov.cn/, http://dof.hainan.gov.cn/
Management Management authority	Administration of Hainan Sanya Coral Reef National Nature Reserve
Legal framework Name of the law/regulation	Marine Environmental Protection Law of the People's Republic of China; Regulation of Marine Special Protected Area Management; Guidelines for the Standardized Management and Construction of MPA
Monitoring and Research	Cooperate with south China Sea Institute of Oceanology, Hainan Tropical Ocean University and the Third Institute of Oceanography. State Oceanic Administration; Research on biodiversity of coral reef; Monitoring of coral reef around projects; Study on the influence to the coral reef after the enhancement of fish; Basic research on morphological characters and habits of marine animals.
Key stress / managerial issues	Inadequate capacity of management and protection; Insufficient funds;
Key stakeholders involved in management	
Relevant network (international programmes)	Daxiao Dongtian Tourism Co., Ltd.
Reference in MPA database	
NOWPAP database[64]	Not included
Protected planet[65]	Sanya Coral Reef National Nature Reserve National Nature Reserve (WDPA ID: 95655) (http://www.protectedplanet.net/sites/Sanya_Coral_Reef_National_Nature_Reserve_National_Nature_Reserve)
MPA global[66]	Sanya shanhujiao Nature Reserve (http://www.mpaglobal.org/index.php?action=showMain&site_code=95655)

[64] http://dinrac.nowpap.org/NowpapMPA.php
[65] http://protectedplanet.net
[66] http://www.mpaglobal.org

Others	IUCN Category V (Protected Landscape/Seascape)
Purposes and reasons of its nomination as target MPA	Have a Management Authority, National Level of MPA, English Communication Skills, Take the biodiversity, rare and endangered species as the main protected target.
Contact point for NEAMPAN	Address: No.1, Guangming Section, South of the Railway, Heping Street, Sanya, Hainan Province, Tel：0898-8895828 URL： http://www.sycoral.com.cn/index.asp

MPA Profile 2

Item	Detail
Naturalness[67]	- 85 km^2 of area; the south coast of Sanya and surrounding of the island
Biogeographic importance[68]	- Reefs made of various corals; - Appropriate hydrologic properties, low latitude and tropical oceanic monsoon climate;
Ecological importance[69]	- Protected targets: coral reef and the marine ecological system - Be rich in organic matter content and hard matrix are good for coral growth - Typical coral reef ecosystem can provide a place of seeking food for plankton, bentonic organism and nekton - Coral reef area is the place of good quality fishes to grow and breed - Over 300 kinds of shellfish and over 300 kinds of marine fossil
Economic importance[70]	- Good quality of seawater and water transparency create good conditions of diving - Colorful coral reefs and various fishes and other marine organism make up a natural underwater park - Develop ecological tourism especially the offshore projects
Social importance[71]	- Take it as the awareness education base - Take full advantage of the area to develop recreational business
Scientific importance[72]	- In favor of the primary ecological study on the coral reef - Make better research on the influence created by development activities

[67] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[68] *Ibid.*
[69] *Ibid.*
[70] *Ibid.*
[71] *Ibid.*
[72] *Ibid.*

	- Provide a scientific base for protecting coral reef ecological system
International or national significance[73]	- China Biosphere Reserve Network - Declaration on the Protection of biodiversity in coastal regions of the South China
Practicality/feasibility[74]	- Establish the Administration of Hainan Sanya Coral Reef National Nature Reserve with three sections which are the general, construction management and inspection; - Build an exhibition shown all kinds of coral reefs; - Has got many equipment of law enforcement, management and research; - With the participation of the local people and enterprises, and the implement of protection of biodiversity in coastal regions of the south China, the reserve has got successes in many activities including the protection and recovery of reefs, management , construction and ecological tourism.

[73] *Ibid.*
[74] *Ibid.*

6. Shankou Mangrove National Marine Nature Reserve[75]

MPA Profile 1

Item	Detail
General information	
Country	China
Name of the MPA	Shankou Mangrove National Marine Nature Reserve (NEAMPAN) Shankou mangrove Nature Reserve (MPAtlas) Shankou Mangrove Nature Reserve (Ramsar Site)
Local name (in national language)	广西山口国家级红树林生态自然保护区
Location	Hepu, Guangxi (Located in Shankou Town, Beihai, Guangxi Province, the Ramsar site is about 105 km east to the Beihai City) Latitude: 21° 33' 36" N Longitude: 109° 42' 15" E 21°28' to 21°37'N; 109°37' to 109°47'E (http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=CPR+16) Center: 21°28′ N 109°43′E Boundary: 21°28' to 21°37'N; 109°37' to 109°47'E (Ramsar site)

Site area (km²)	8,000 ha (80 km²)
	• 40 km² of marine area (MPAtlas)
	• 40 km² of Ramsar Site included
	• UNESCO-MAB
	  ○ Core areas: 824 ha (marine)
	  ○ Buffer zone: 3,600 ha (marine)
	  ○ transition areas: 3576 ha (of which marine: 600)

Marine components	According to the MPA global[76], marine/intertidal/subtidal 62% of intertidal mudflats and 38% of mangrove forests (Ramsar site)
Year of establishment	1990 • 2002, Ramsar Site • 2000, UNESCO-MAB
Geographic and habitat classification	Protected targets: Mangrove ecosystem (several mangrove species endangered in China (*Rhizophora stylosa*, *Bruguiera gymnorrhiza*), as well as rare seagrass species and the sea mammal Dugong dugong) The biosphere reserve includes mangroves, salt marshes and seagrass habitats, and this combination of three coastal habitats in a single

[75] http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=CPR+16
[76] http://www.mpaglobal.org/home.html

	location is rare along China's coast. Climate: tropical monsoon climate zone and tropical rainforest region, with thunderstorms, typhoons and strong tides frequently in spring and summer (annual average temperature: 23.4 °C; annual average precipitation: 1,700—2800 mm) Land form: alluvial terrace - Long and narrow marine-deposition plains are formed among the terraces, shorelines and estuaries. The intertidal mudflat is wide and flat with deep silts. 16 mangrove species, 251 macrobenthos species, 5 nekton species, 36 zooplankton species, 20 plant plankton species, 118 bird species and 301 insect species
Physical features	**Geology and geomorphology**: Landform in the Reserve is characterized mainly by ancient alluvial and diluvial sedimental mesa with which to form a narrow-long marine soil between ancient coastline and modern coastline. Marine erosion cliffs are found at the part of Ying Luo Gang. Most parts of marine soil plain have been reclaimed into farmlands, saltern and ponds for raising shrimps. On the eastern and western sides of Shatian peninsula are easy to spread out for rice-grass salt marsh where grown mangrove forest. Salt marsh and mangrove forest form a protective green barrier to protect the farmlands and villages along the coast. The main geographical types in the Reserve consist of loose deposit of the Quaternary System, olive basalts and the basic igneous (volcanic) rock. 80% among them is the first one. The loose deposit of the Quaternary System occurs in the beach of Dan Dou Hai. It is 1.5-10.5 m in depth. Basalt and base igneous rock appear from Xin Cuen in Yin Luo Gang to Ma An Lin along the beach. It is about 4-6 km long. **Soil feature:** The fertilization of soil in Shankou Reserve shows that it is higher in inner shoal than outer shoal regularly. The content of heavy metal in soil shows: Zn>Pb>Cu>Cd. The content of heavy metal in the forest is highest. The main soil type in the reserve is the mangrove intertidal solonchak, covering approximately 930 ha. And its distribution is basically consistent with the mangrove forests. The soil is affluent in organic matters and sulfate ions, and the acidity is relatively high. The soil profile usually shows dark gray. The content of organic matters in the middle-lower layer is usually higher than the surface layer. **Hydrological values:** The air temperature of Shankou is not more variable through the year. It is 13.8 °C. The average temperature for a year is 23.4 °C. The extreme high temperature is 38.2 °C and the extreme

	low temperature is 1.5 ºC. 80-90% annual rainfall concentrates in April to September. The rainfall through all of year is 1,573.4 mm and the fate amounts to 144 days. The rainfall and fate are fewer than other regions along the coast in Guangxi. The relative humid varies from 71.6% in November to 84.5% in April. The average value is 79.9%. The tide of Shankou occurs every day. The tide different is 2.45 m. There are 4 rivers flowing into this site altogether, including Wuliu River, Ximi River, Daba River and Najiao River. The annual water flux is up to 500,000,000 m^3. **Water quality:** The highest, lowest and average chlorinity of the sea water is 33.2‰, 16.3‰ and 28.9‰, respectively. While in Sanjiang estuary which is the hinterland of the mangroves, the highest, lowest and average chlorinity of the sea water is 15.9‰, 9.41‰ and 12.6‰, respectively. **Tide:** The tidal type is irregular diurnal tide in this site. In a year, the diurnal and semidiurnal tides account for 60% and 40%, respectively. **Climate:** Located in the transitional region from the north tropical to the south subtropical zone, it is greatly influenced by monsoon climate and marine climate. The mean annual temperature in this site is 23.4 ℃, with an extreme lowest temperature of 2 ℃. The mean annual precipitation is 1,500-1,700 mm. The difference between the dry season and wet season is distinctive. Typhoons and storms, mostly accompanying with thunders, often happen between April and September as well. The typhoon can bring storms and waves to strike the sea coast, producing huge destructive force. **Catchment area**: The catchment area is about 120,000 ha, and the annual water flow is about 5×10^8 m^3. Main crops in the catchment are rice, peanut and cassava, and the aquaculture of shrimp and shellfish is well developed. All the water flows converge in Yingluogang and then flows southward into Beibu Gulf. The land is mainly composed of soft sediments of the Quaternary Period. The bays in the catchment are typical liman bays, and the intertidal zone expands outward from the estuaries. The land is primarily represented as hills and mountainous regions, with gentle slopes and abundant vegetation. The nearshore land is fertile with high phosphor content. There are abundant rainfall and long sunshine hours Altitude: -15~+30 m Elevation: 20 m (average), 0~40 m (min-max) Mangroves in the wetland; farmland planted crops and vegetables in

	surrounding areas Current land (including water) use Within the Ramsar site: - Natural mangroves, mudflats and shallow sea waters are the main wetland types within the Ramsar site. Most of the wetland is being strictly protected, despite a small part remained as the fishing field for nearby villagers. Meanwhile, it is the important place for wetland research and mangrove ecological education. This site is located within the reserve, including the core area and the most parts of the buffer area. - The core area of the reserve is composed of 2 regions. One is Yingluogang Core Area located in the east of Shatian Peninsula. It covers an area of 800 ha and includes most of the mangrove forests and the related mudflats in Yingluogang Bay. The other is Dandou Sea Core Area, located at the Yongan coastal section on the west side of Shatian Peninsula and covering an area of 24 ha.. In the core areas, there is no residential area, and the human disturbance is little. - The buffer area is 3,600 ha. Besides the coastal mudflats, there is also a certain area of natural or artificial forests with young ages. As the species composition is relatively simple and the distribution is relatively scattered, their ecological functioning is vulnerable. There is no residential area in this area. - The experiment area occupies 3,576 ha. Its major functions are to artificially restore the mangrove ecosystem, to develop scientific experiments, to cultivate mangrove seedlings, and to develop forest tourism, diverse management, education practices and sea exploitations of the people in the surrounding areas. In the surroundings/catchment: Ponds and farmlands are prevailing. Aquiculture and rice cultivating are the main agricultural activities.
Conservation status	Territorially, the reserve is under the jurisdiction of the state. Functionally, the reserve is supervised by the Department of Land and Resources of Guangxi Province and State Oceanic Administration of China. Land tenure/ownership: - Within the Ramsar site: State ownership/ the utilization right belongs to the reserve. - In the surrounding area: State ownership/ the local collective have the right to use the land.
Regulatory frameworks	
<u>Administration</u> Responsible ministry or agency	Management Division of Shankou National Mangrove Nature Reserve, the State Ocean Administration and the Guangxi Ocean (UNESCO-MAB)

Management Management authority	Bureau of Shankou Mangrove National Reserve, Guangxi (Ramsar site)
Legal framework Name of the law/regulation	- Measures of Managing Shankou National Mangrove Reserve (1994) - Regulations of Natural Reserve of China (1994) - Administration of Marine Reserve, and Law of Marine Environment Protection of China (1995) - Management Plan of Shankou Nature Reserve
Monitoring and Research	- Investigation of afforestation; - Structural and functional stability of mangrove systems; - Monitoring of the water body, fish and plant species; - Environmental impact monitoring of tourism activities; and - Mapping of the different zones of the biosphere reserve (UNESCO-MAB)
Key stress / managerial issues	At the site: The main effect on the Reserve is human activities destroying mangrove forest to raise shrimps and catch economic animals habited in mangrove forest. Around the site: The human activity makes the secondary mangrove forest not be able to recover, even makes the forestation test continue difficultly. It is leading to the resources decline through the food chains. Afforestation of mangrove forests has been carried out since 2002. Approximately 200 ha mangrove forests have been restored. The biodiversity tends to be richer.
Key stakeholders involved in management	
Relevant network (international programmes)	IUCN category V UNESCO-MAB
Reference in MPA database	
NOWPAP database[77]	Not included
Protected planet[78]	Shankou hongshulin Nature Reserve (WDPA ID: 95615) (http://www.protectedplanet.net/sites/95615) Shankou Mangrove Nature Reserve (WDPA ID: 900682) (http://www.protectedplanet.net/sites/900682)
MPA global[79]	Shankou hongshulin

[77] http://dinrac.nowpap.org/NowpapMPA.php
[78] http://protectedplanet.net
[79] http://www.mpaglobal.org

	(http://www.mpaglobal.org/index.php?action=showMain&site_code=95615)
Others	<MPAtlas> Shankou hongshulin Nature Reserve (http://www.mpatlas.org/mpa/sites/2564/) Shankou Mangrove Nature Reserve (http://www.mpatlas.org/mpa/sites/7291/)
Purposes and reasons of its nomination as target MPA	
Contact point for NEAMPAN	Mr. Huang Qi (黄琦) Deputy Director Guangxi Shankou Nature Reserve (广西山口红树林自然保护区，副主任) Telephone：+86-18907791308 Email：464215227@qq.com Chen Qiying Shankou National Mangrove Nature Reserve Management Division NO.278 Yun Nan load， Beihai City 536000 , Guangxi Zhuang Autonomous Region China Telephone (+86—0779) 3832609 Fax (+86—0779) 3832622 E-mail 464215227@qq.com

MPA Profile 2

Item	Detail
Naturalness[80]	The extent to which the area has been protected from, or has not been subject to human-induced change
Biogeographic importance[81]	- Rare biogeographic qualities - Representative biogeographic type(s) - Any unique or unusual geological features
Ecological importance[82]	Mangrove swamp characterized by *Rhizophora stylosa*, *Bruguiera gymnorrhiza*, *Aegiceras corniculatum*, *Kandelia candel* and *Avicennia marina*; salt marsh dominated by *Spartina anglica*; sea grass habitats dominated by *Halophila ovalis* and *Halodule uninervis*; farm and dry land with Eucalyptus *exserta*, *E. citriodora*, rice, peanut, sugarcane, etc. <u>Ecological features</u> There 14 species of mangroves in the Reserve. The main constructive species are *Rhizophora stylosa, Kandelia candel, Aegiceras corniculatum, Avicennia marina, Bruguiera gymnorrhiza, Excoecaria. Agallocha*. They build six kinds of typical mangrove form along Gaungxi coast. From low tide line to high tide line, the soil varies form sandy soil, loam, clay to half-solid. The communities in proper order are the forms builded by *Avicennia marina*, *Kandelia candel*, *Rhizophora stylosa* and *Bruguiera gymnorrhiza*. The compound form of *Avicennia marina* - *Aegiceras corniculatum* distributes widely and it can be found in different soil types. In the mangrove forests, there are five dominant communities such as the *Rhizophora stylosa* and *Bruguiera gymnorrhiza* communities. The mangrove forest usually develops three layers. The upper layer is dominated by *Bruguiera gymnorhiza*, the mid layer by *Kandelia candel* and the under layer by *Aegiceras corniculatum* and *Aricennia marina*. Mangrove forests are the main habitats for umbrettes such as *Butorides striatus*. The intertidal mudflats nourish many benthic fishes such as *Periophthalmus Cantnensis* and *Pisoodonophis boro*, and Molluscs such as *Tegillarca granosa* and *Meretrix meretrix*. These species are of high economic value, not only serving as the foods of grallatores such as *Tringa tetanus* and *Charadrius mongolus*, but also being important economic resources for local residents. Shallow sea waters support prolific zooplankton and

[80] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[81] *Ibid.*
[82] *Ibid.*

	phytoplankton, and they are also favorite habitats for swimming birds such as *Anas falcate* and most fish species. <u>Noteworthy flora</u> *Rhizophora stylosa* community: distributed in central and inner beach, single-storied arbor forest, 4.5-5.5 high and extremely developed pillar roots. It is not efficient in regeneration by seedling. This population is characterized in this Reserve with 80 hectares area in YingLou Gang. *Bruguiera gymnorrhiza* community: distributed more than *Rhizophora stylosa*, arbor, 5.7m high, this form is in the later stage of communities' evolution. *Avicennia marina* community: distributed in group near to Dan Dou Hai with large area, usually near to the low tide line of mangrove forests` outline. Sometime can be found in the central and inner beach. The forest appears silvery-gray, about 1.0-1.5 m high. *Kandelia candel* community: mainly distributed in central to central-out beach, having stronger ability ageist cold weather, bad regeneration in the nature, sporadic distributed, 12.5-3 m high, formed different forms. *Aegiceras corniculatum* community: wide distributed in large area, especially in ocean's outskirts or the junction of bay and river mouth, yellow-green appearance, 1.2 m high, have good regeneration by seedling. *Excoecaria agallocha* community: a semi-mangrove community on the sea wall over tide line and river mouth, abundant species of salt tolerant land under brushes, regeneration by shoots, 4-5 m high, maximum to 8 m. Other creatures: There are 251 species of large benthonic animals, 42 species of fishes, 118 species of birds, 96 species of phytoplankton, 26 species of zooplankton, 128 species of benthonic diatom and 301 species of insects. There are *Spartina anglica* (rice grass) and seaweed as well. It is very rare that so many marine higher plants such as mangrove, rice grass and seaweed just in a Reserve along southeast coast in China. (*Scienc Report of Shankou Mangrove NR, 1997* & *National Wetland Conservation Action Plan, 2000*)

	Mangrove is the main natural plant community in the site. The reserve holds 10 true mangrove species and 6 semi-mangrove species. In Pearl Bay there are 135.5-ha mangrove forests growing on the mudflat under average sea level, which is rare and is a representative characteristic of the mangrove in the reserve. The site is also an important region where sea grass ecosystems are distributed. In the peripheral region of the mangrove forest in Pearl Bay, *Zostera marina* sea grass communities flourish in the low tide areas. Moreover, the reserve is the only growing place of natural population of *Heritiera litoralis* along the coast in the Beibu Gulf of Guangxi Province. The main plant communities in this site are listed as follows: **i) *Aricennia marina* association:** This kind of association is widely distributed in the areas with different mudflat positions or soil textures (silt, semi-sediment or sand). It has a height of 1.0-2.5 m, showing a silver gray color. The coverage ranges between 40% and 90%. Species composition is relatively simple, with *Aricennia marina* as the dominant species. The growing status of *Aricennia marina* varies with mudflat positions and soil textures: It can grow very well in the silt habitat of middle/inner mudflats, within which the height can reach 2.5 m, and the basal diameter can reach 18 cm with obvious trunks. While in other habitats, the growth is not good as those above, and the plant branches at the neck of roots, forming shrub clumps without obvious trunks. The association is usually accompanied with *Aegiceras corniculatum*. Occasionally, there are some other scattered species such as *Kandelia candel*. The structure of the community shows mono-layer or double-layer. The soil surface is densely covered by bamboo shoot-like pneumatophore in the community. **ii) *Kandelia candel* association:** The distribution of this kind of association is wide in the site. However, it often shows small isolated patches on the mudflats, despite some parts where relatively large continuous patches exist. It can be often seen from the middle mudflats to the middle outer mudflats, where soils are semi-sediments. The community takes on a turquoise color, with a height range of 1.8-2.5 m and a coverage range of 60%-85%. For those that are often lopped, the association appears like shrubs with a height of 1.0-1.5m. The predominant species is *Kandelia obovada*, which has undeveloped buttress roots. And the companion species are *Aegiceras corniculatum* and *Avicennia marina*. The community structure generally exhibits double-layer.

iii) *Excoecaria agallocha* association:

This kind of association usually grows along the high-tide line. The communities are often repeatedly lopped and are shaping shrubs with heights of 0.8-6m and coverage of 30%-50%. The predominant species is *Excoecaria agallocha*, but on some partial mudflat locations there are *Kandelia obovada*, *Aegiceras corniculatum* and some other species. The community structure is represented as mono-layer or double-layer.

iv) *Bruguiera gymnorhiza* association:

This kind of association is mainly distributed inside the Pearl Harbor, forming a pattern of narrow belt along the interior edge of the mudflat. The soil is silt or half-hardened silt, the community has a regular formation in deep green color, or exhibits rough surface with mixed color of yellow and green. The height of the community is 3.0-6.5m, and the coverage is 60%-85%. The community is dominated by *Bruguiera gymnorhiza*, accompanied by *Aegiceras corniculatum*, and with some scattering species, such as *Kandelia candel*. The community structure is usually represented as double-layer.

v) *Aegiceras corniculatum* association:

This kind of association is mostly distributed on the exterior edge of the mudflats and the junctions of the estuaries. The whole community is in olivine, the height is 1.0-1.8m, and the coverage is 50%-95%. *Aegiceras corniculatum* is the dominant species, with a shrub-like formation. In some areas, *Aricennia marina*, *Bruguiera gymnorhiza* and *Kandelia candel* are mixed and form simple-structured communities with mono-layer.

vi) *Rhizophora stylosa* association:

This kind of association of small size is artificially built from the 1980s to 1998, being distributed between the interior mudflat and the middle-interior mudflat. The soil is argillaceous silt, the entire community is in dark green, the height is 3.5-6.5 m and the coverage is 80%-90%. *Rhizophora stylosa* is the dominant species. Its extremely developed prop roots can form arciform prop root system with a height of 1.0-2.0 m. In addition, a small amount of *Bruguiera gymnorhiza*, *Kandelia candel* and *Aegiceras corniculatum* are scattered. The community structure is simple with mono-layer.

<u>Noteworthy fauna</u>

Many endangered marine animals occur in Shankou National Reserve, such as Dugong, Chinese dolphin, Pearl oyster and

	Horseshoe crab, etc. Especially in recent two years, Dugong and Chinese dolphin often appear in the Reserve and surrounding region. There are 179 species of the other marine animals, including many large benthonic animals and marine invertebrates in the mangrove forest. There are 132 species of birds of National Second Class protected animal in China, some of them are national endangered species in the monitoring by many years, these birds survive strongly on the mangrove forest, and the population of same birds shows trends of number increase. (*Scienc Report of Shankou Mangrove NR, 1997* & *National Wetland Conservation Action Plan, 2000*) There are 251 macrobenthos species in the site, including 27 polychete species under 24 genera, 48 mollusk species under 34 genera (including 29 bivalve species under 22 genera and 19 gastropod species under 12 genera), 35 crustacean species under 23 genera, 1 echinoderm species under 1 genus, 5 benthos fish species under 5 genera and other 8 animal species under 7 genera. Fish species number is up to 95. There are also 108 bird species under 49 families of 16 orders, including one endangered species in the IUCN Red List. Besides, there are 26 zooplankton species, 10 mammalian species, 25 reptile species and 11 amphibian species. *Platalea minor* (IUCN Red List_EN) & 118 bird species, 95 fish species, 251 macrobenthos species, 301 insect species, 36zooplankton species and 20plant plankton species (RIS 2010-2016)
Economic importance[83]	Most of the local people (totalling some 34,000 in the transition area in 1998) are originally from the Fujian coast area (eastern China) and are descendants of Han nationality. Their main economic activities are rice and commercial crop cultivation as well as livestock husbandry, mariculture and shallow water fishing. Development opportunities include sustainable mariculture (mudflat and offshore mariculture, including pearl cultivation), further development of ecotourism, shoreline protection, duck-raising, bee-keeping, processing of edible fruits of the mangrove species Avicennia marina etc. Frequent visits by local and national officials provide scope for demonstration and improvement of protection and resource use strategies in China's marine coastal environment. Shankou Mangrove Biosphere Reserve also offers considerable potential for

[83] *Ibid.*

	collaborative activities with other mangrove biosphere reserves in the region, such as Ranong Biosphere Reserve in Thailand and Can Gio Mangrove Biosphere Reserve in Vietnam.
Social importance[84]	Researches on the construction design, eco-breeding experiments were conducted in recent years, also as a base the Mangrove seedling cultivation, fish dynamic monitoring, mangrove insects, productivity and social economy were studied in the Reserve. There are regular many kinds of conservation publicity activities concerning surrounding society, and eco-tourists education was held, all of these have obtained significant social efficiency. Short-term training class was held for Reserve staff once a year. The Reserve and the Shenzhen Mangrove & Birds Reserve in Guangdong province are the members of MAB Reserve network in China; both Reserves have established business relations, and exchange staff for learning. Also the Reserve has close relations with Hekou marine Reserve in Guangxi province, National zhanjiang magrove Reserve in Guangdong province, National dongzhaigang mangrove Reserve in Hainan province. Some staff of the Reserve joined training in Hongkong Mipu mangrove Reserve, and there are planned cooperation with the latter Reserve. There have been sister Reserves of the Reserve and Rookery Bay National Estuarine Research of United States since 1997, and the Reserve was approved as a member of MAB in January 1, 2000. Existing facilities for publicity and education: broadcasting station, video recorder, specimen exhibition room, publicity poster and brochure, attention brand, view-sight place, trestle in forest. In history, especially in the end of 1950s to the middle of 1970s, the large area of beach is used for saltpans and fields. The actions led to reducing the areas of mangrove. At that time, the mangrove was used as fuel. Most of mangrove becomes shrub-like. At the present, there are 80000inhabitants of 9277 families in the transition zone of Reserve region. The personal mean annual income is 5654 yuan. The people live mainly on cultivate rice and crops. Some of them are fisher or raise domestic animals.

[84] *Ibid.*

	**** In recent years, the mangrove wetland has become a new highlight of tourism, and the eco-tourism has been developed in the reserve with science popularization and education as the major goal. Every year, there are nearly 100,000 tourists throughout the country spontaneously spending their holidays touring and sightseeing in the mangrove wetlands. At present, it is an educational base for science popularization authorized by the departments of environmental protection, science and technology and education in Guangxi Province. <u>CEPA activities</u> In 2003, the reserve organized many primary and middle school students visiting the reserve to propagandize the importance of mangrove and waterfowl conservation and thus to promote the public awareness of conservation. In 2004, the reserve published mangrove brochures and built 2000-m visiting bridges. In 2007, a website of the reserve was established. Eco-tourism was developed in the Yingluo mangrove forests. *** Mangrove wetland has particular significance in scientific research, cultural education, tourism, community service and environmental monitoring. Also, it is of great value in developing marine fishery, aquaculture and agriculture. Within the wetland, the main industries are prawn, fish and shellfish culture, together with rice culture and forestry, which are the important income sources for the native residents. Moreover, the reserve has become the education base for primary and middle school students to learn about natural protection and the practice base for college students. This site is the largest mangrove wetland in China, which is of vital significance in protecting biodiversity of mangrove forests.
Scientific importance[85]	**Criterion 2:** Shankou Mangrove Forest National Reserve is an important wetland with abundant biodiversity. There are 14 species mangroves, many species benthonic diatom, phytoplankton, zooplankton, large benthonic animals, vagrant animals (fishes), insects, birds as well as microbes which have not been studied deeply. These creatures rely directly or

[85] *Ibid.*

	indirectly to different extent on the 14 kinds of mangroves as being primary producers. It is of great importance and significance to protect the mangrove forest for maintaining high biodiversity and biological process of Shankou coastal wetlands. **Criterion 4:** Shankou mangrove Reserve is an important habitat coastal wetland birds Shankou Reserve lies on an important way of migrant birds among East Asian continent, China-India Peninsula, the Pacific islands and Australian continent. In annual migratory seasons, a lot of migrants rest or inhabit temporarily in this Reserve. This has greatly enriched the birds` diversity. Among the birds, there are a great number of water birds. They rest in the mangrove or on the beach. In Shankou Mangrove Reserve, there are 106 species of birds belonging to 32 families, of them, 13 species birds are listed as National second class protected animal. (*Investigation on national ecological Reserve of Mangrove in Shankou, Research on the systematical character of Mangrove and their resemble utility 1997, National Wetland Conservation Action Plan 2000*) One of the important migratory routes of migratory birds among the East Asia, China-India, the Pacific islands and Australian continent <u>Scientific research and facilities (as of 2007)</u> In 2005, the reserve participated in the "Demonstration Project of Biodiversity Management along the South Coast of China", and became one of the international demonstration districts. Since 2004, conventional investigations of the reserve have been carried out. Wetland monitoring programs were initiated in 2002. The monitoring items include: surface and ground water quality, climate, hydrology, plants, birds, fishes, zoobenthos, invasive species and etc. Since 2005, the technologies of *Rhizophora stylosa* cultivation have been generalized in sylvicultural activities. And some achievements have been obtained. In 2005, one plant nursery of 0.5 ha, one reading room of 30 m^2, one specimen room of 50 m^2 were established. Three vehicles and one survey ship were equipped.

International or national significance[86]	- any potential to be listed on the World or a national Heritage List or declared as a Biosphere Reserve or included on a list of areas of international or national importance or is the subject of an international or national conservation agreement
Practicality/feasibility[87]	Mangrove forests of this site can effectively alleviate coastal erosion and damages of typhoon, protect the coastline and purify water.

[86] *Ibid.*
[87] *Ibid.*

MPA PROFILES-JAPAN

Shiretoko National Park

MPA Profile 1

Item	Detail
General information	
Country	Japan
Name of the MPA	Shiretoko National Park
Local name (in national language)	知床国立公園
Location	Shari-town and Rausu-town, Hokkaido The marine area of the Shiretoko World Heritage Site which overlaps with the marine area of the Shiretoko National Park, and locates at approx. 44°N and approx. 145°E.
Site area (km²)	Approx. 224 km² (marine area only; within 3 km from the coastline of the Shiretoko Peninsula) c.f. Total area of Shiretoko National Park: approx. 711 km²
Marine components	marine / intertidal / subtidal
Year of establishment	17 July 2005
Geographic and habitat classification	*(The following information is taken mostly from* "Shiretoko" refers to the Shiretoko World Natural Heritage Site (hereinafter referred to as the "heritage site") and its surrounding sea areas. Belonging to the subarctic zone, Shiretoko is situated at the lowest latitude among the world's seasonal sea ice in the northern hemisphere, and is featured by the interaction between its terrestrial ecosystem and adjacent marine ecosystem with unique seasonal sea ice characteristics, and anadromous salmonids running up the rivers. Shiretoko is an important area for a large number of marine and terrestrial species. There are a wide variety of marine life inhabitants, including sea eagles and many other rare species, a large number of salmonids running up the rivers, and marine mammals such as Steller sea lions and cetaceans. In addition, the area is internationally important as a habitat of globally threatened seabirds and a stopover point for migratory birds. The waters surrounding Shiretoko have high productivity, and for many years, fisheries activities have been conducted in harmony with the marine life. (Reference: *Section 1 (1) of the Multiple Use Integrated Marine Management Plan: http://shiretoko-whc.com/data/management/kanri/seawg_kanri_en.pdf)*

Physical features	The Shiretoko Peninsula is located in the northeastern tip of the Hokkaido Island. The narrow peninsula is approximately 25 kilometers wide at its base and protrudes 70 kilometers out to the southern boundary of the Sea of Okhotsk. It is flanked by the Sea of Okhotsk in the west and the Nemuro Straits in the east. The area is affected by the East Sakhalin cold current and the Soya warm current. This area has a complicated marine character created by these two currents together with the intermediate cold water derived from the Sea of Okhotsk, and forms the marine ecosystem where welter of organisms migrate and live. The Shiretoko Peninsula was formed by volcanic activities and uplift from the Pacific Plate subducting under the North American Plate. The contrasting coastlines on the east and west sides of the peninsula were formed by a combination of volcanic activities and marine erosion. On the coast facing the Sea of Okhotsk, the deposits of ejecta from more than one million years ago are eroded by waves as well as sea ice which resulted in the development of sea cliffs. Especially around Utoro, there are spectacular sea cliffs ranging from 60 meters to 120 meters in height consisting of andesitic lava from the eruption of Mt. Rausu 80,000 years ago and subsequent marine erosion. In contrast, the coastline on the Nemuro Straits side is smooth. Along this coast, there are curious rock formations that are the result of differential erosion of the hyaloclastite layer. Despite being close to the shore, the topography of the ocean floor at the tip of the Shiretoko Peninsula (Shiretoko Cape) forms a steep slope, and the area within 3 km from the coastline includes 90% or more of that 200 m or less deep. In some areas, the depth can reach 2,000 meters. Forty-four rivers flow into the marine area. There are no large rivers in Shiretoko, but only small rivers with steep gradients that spill straight out into the sea as torrents flowing through narrow ravines. Due to the impact of volcanic activities, some rivers contain sulfur. Data on salinity in the waters off Shari and Rausu are available at: http://mtcs.hkso.co.jp/me/me1.htm (website available in Japanese only). (Reference: *Japan's nomination report of Shiretoko for inscription on the World Heritage List, 2004: http://dc.shiretoko-whc.com/data/process/200401/english_01/E0301.pdf; and IUCN's Technical Evaluation Report on Shiretoko (Japan) ID No: 1193, 2005: http://shiretoko-whc.com/data/process/200507/iucn_houkoku.pdf.)*

Conservation status	***Ownership*** There is no ownership of the marine area. ***Conservation status*** *(The following list is a translated excerpt from Section 2 (1) of the Marine Management Plan revised in 2013.)* • Both the number of days on which the seasonal sea ice is observed and its volume appears to be on the decline. Furthermore, the temperature over the Sea of Okhotsk has risen two degrees Celsius over the past 50 years. This warmer temperature has led to a decline in the formation of seasonal sea ice, which in turn has affected the cooling of the saline water and has weakened the vertical mixing of the sea water in the western North Pacific. • Among the many interactions between the marine and terrestrial ecosystems, the salmons swimming upstream for spawning have been confirmed to serve as carriers of important substances from the ocean to land. • The taxonomic index shows that the biodiversity in the shallow sea area is high. Moreover, the marine nutrient level in this marine area is increasing despite its decline globally. • The population of the Asian portion of the Steller sea lions, to which the ones observed in Japan belong, has gradually increased since the 1990s. Likewise, although it is difficult to obtain an accurate number, the population of spotted seals that inhabit the Sea of Okhotsk is considered to be on the rise, owing to the decline in seal hunting and human use. • While marine recreation activities such as nature sightseeing from tour boats, leisure fishing and sea kayaking are conducted in the marine area, there are efforts to conserve the scenic landscape and sustainable ecosystem though established rules (cf. http://shiretoko-whc.com/press/rule.html) such as "Conduct in the Use of the Shiretoko Peninsula Apical Region", as well as business operators establishing self-imposed rules for the protection of resources and environmental conservation. The marine environment and biological (primary) productivity, coastal environment, fish and shellfish, marine mammals, sea birds, sea eagles, and marine recreation are managed pursuant to the Multiple Use Integrated Marine Management Plan for Shiretoko World Natural Heritage Site, which was established in 2007 with the aim of maintaining a balance between the conservation of the heritage site's marine ecosystem and its appropriate use for human activities (such as fishing and marine recreation). The aforementioned Management Plan has been revised in 2013, and is available at the following site (the revised Plan is available only in

	Japanese): http://dc.shiretoko-whc.com/management/sea.html
Regulatory frameworks	
Administration	Ministry of the Environment (http://www.env.go.jp/en/index.html) Hokkaido Prefectural Government (http://www.pref.hokkaido.lg.jp/foreign/english.htm)
Management	Ministry of the Environment (http://www.env.go.jp/en/index.html) Hokkaido Prefectural Government (http://www.pref.hokkaido.lg.jp/foreign/english.htm)
Legal framework	- Natural Parks Law - Law for Conservation of Endangered Species of Wild Fauna and Flora (1992) - Water Pollution Control Law - Law Relating to the Prevention of Marine Pollution and Maritime Disaster - Law Concerning Conservation and Management of Marine Life Resources - Regulation of Sea Fisheries Adjustment in Hokkaido & Regulation of Inland Fisheries Adjustment in Hokkaido (based on the Fisheries Law and Fisheries Resource Protection Law) (All are available at http://law.e-gov.go.jp/ in Japanese.)
Monitoring and Research	Shiretoko World Heritage Area Long-Term Monitoring Plan (http://dc.shiretoko-whc.com/data/management/kanri/chiki_kanrikeikaku_eng.pdf)
Key stress / managerial issues	The main managerial issue is maintaining the balance between the conservation of the marine ecosystem in the marine area of the heritage site and the proper use of the area for human activities such as fisheries and marine recreation.
Key stakeholders involved in management	Fisheries Cooperatives (http://www.jf-sharidaiichi.or.jp/; http://www.pref.hokkaido.lg.jp/sr/ske/osazu/oz06gok/gok050.htm; http://www.jf-rausu.com/) Tourism Associations (http://www.shiretoko.asia/; http://www.rausu-shiretoko.com) Shiretoko Eco-tourism Association http://shiretoko-eco.net/
Relevant network (international programmes)	Convention Concerning the Protection of the World Cultural and Natural Heritage
Reference in MPA database	
NOWPAP database[88]	not listed
Protected planet[89]	• Shiretoko National Park (WDPA ID 742): http://www.protectedplanet.net/shiretoko

[88] http://dinrac.nowpap.org/NowpapMPA.php
[89] http://protectedplanet.net

	• Shiretoko World Heritage (WDPA ID 902482): http://www.protectedplanet.net/shiretoko-world-heritage-site
MPA global[90]	• Shiretoko: http://www.mpaglobal.org/index.php?action=showMain&site_code=742
Others	
Purposes and reasons of its nomination as target MPA	Since this MPA is managed by the various stakeholders including fishermen
Contact point for NEAMPAN	Mari Yamazaki http://www.env.go.jp/en/index.html

MPA Profile 2

Item	Detail
Naturalness[91]	Shiretoko is situated at the lowest latitude among the world's seasonal sea ice in the northern hemisphere, and is featured by the interaction between a terrestrial ecosystem and a contiguous marine ecosystem with unique seasonal sea ice characteristics, and anadromous salmonids running up the rivers. (Reference: *Section 1 (1) of the Multiple Use Integrated Marine Management Plan: http://shiretoko-whc.com/data/management/kanri/seawg_kanri_en.pdf)*
Biogeographic importance[92]	Shiretoko Peninsula is a narrow and long peninsula approximately 25 kilometers in width at its base and 70 kilometers in length, jutting into the southern boundary of the Sea of Okhotsk. It is flanked by the Sea of Okhotsk on the west and the Nemuro Strait on the east. On the east side of the Shiretoko Peninsula lies Kunashiri Island in a close parallel with the peninsula. Due to topographical and geographical conditions, the Sea of Okhotsk is the most southern (lowest latitude) ocean in the northern hemisphere as a seasonal sea ice area. The northeastern part of the Eurasian Continent, windward of the Sea of Okhotsk, is the Pole of Cold in the north hemisphere and extreme cold air outbreaks effectively chill the seawater. In addition, because the surface layer of the Sea of Okhotsk has low salinity and density, the convection current in winter

[90] http://www.mpaglobal.org
[91] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[92] *Ibid.*

	cannot reach the deeper layers. When seasonal sea ice is formed in the north of the Sea of Okhotsk, intermediate water of low temperature and high salinity is produced. A portion of this intermediate water, rich in nutrient salts, spreads to the marine areas surrounding the Shiretoko Peninsula. In addition, the heritage site and its surrounding areas are situated at the southern edge of the zone where the seasonal sea ice formed in the Sea of Okhotsk reaches coasts. Ice algae proliferates under seasonal sea ice and the intermediate water with rich nutrient salts (created by vertical mixing when seasonal sea ice is formed) rises to the surface layer due to a vertical mixing effect, triggering phytoplankton blooms which form the base of a food web consisting of zooplanktons that feed on the phytoplankton and the higher level consumers such as fish, marine mammals, and terrestrial wildlife. (Reference: *Section 3 (3) a. and b. of the Management Plan for the Shiretoko World Natural Heritage Site: http://dc.shiretoko-whc.com/data/management/kanri/chiki_kanrikeikaku_eng.pdf)*
Ecological importance[93]	Shiretoko is an important area for a large number of marine and terrestrial species. There are a wide variety of marine life inhabiting, including sea eagles and many other rare species, a large number of salmonids running up the rivers, and marine mammals such as Steller sea lions and cetaceans. In addition, the area is internationally important as a habitat of globally threatened seabirds and a stopover point for migratory birds. (Reference: *Section 1 (1) of the Multiple Use Integrated Marine Management Plan: http://shiretoko-whc.com/data/management/kanri/seawg_kanri_en.pdf)*
Economic importance[94]	Fishery is the main industry for the area. The sustainable use of marine resources such as chum salmon, pink salmon, walleye pollock and kelp is promoted, with the support of high productivity of the sea. In recent years, new recreational activities such as sea kayaking, personal watercraft, and scuba diving are becoming more popular in the waters surrounding Shiretoko, in addition to the conventional sightseeing and leisure cruise, angling, and so on. (Reference: *Section 3 (4) b. and c. of the Management Plan for the Shiretoko World Natural Heritage Site: http://dc.shiretoko-whc.com/data/management/kanri/chiki_kanrikeikaku_eng.pdf and*

[93] *Ibid.*
[94] *Ibid.*

	Section 2 (3) f. of the Multiple Use Integrated Marine Management Plan: http://shiretoko-whc.com/data/management/kanri/seawg_kanri_en.pdf))
Social importance[95]	Ecological system in Shiretoko grows local culture, develops fishery and tourism as key industries and provides grounds for education and research. (Reference: *Section 1 (1) of the Second Multiple Use Integrated Marine Management Plan: http://dc.shiretoko-whc.com/data/management/kanri/seawg_kanri_2ndterm.pdf)*
Scientific importance[96]	It is necessary to conduct research and monitoring and understand accurately the trends and dynamics of marine environment, marine structure, and indicator species of the marine ecosystem, and others that provide basic data for the various analyses of the meteorological and oceanographic phenomena, the sea ice, and so on, in the waters surrounding Shiretoko. (Reference: *Section 2 (3) a. of the Multiple Use Integrated Marine Management Plan: http://shiretoko-whc.com/data/management/kanri/seawg_kanri_en.pdf)*
International or national significance[97]	Shiretoko was listed on the World Natural Heritage Site.
Practicality/feasibility[98]	

[95] *Ibid.*
[96] *Ibid.*
[97] *Ibid.*
[98] *Ibid.*

MPA PROFILES – REPUBLIC OF KOREA

1. Muan Wetland Protected Area

MPA Profile 1

Item	Detail
General information	
Country	Korea
Name of the MPA	Muan Tidal-flat Wetland Protected Area
Local name (in national language)	무안갯벌
Location	Muan-gun, Jeollanam-do, Republic of Korea 126°20′19″ --- 126°27′09″ E 35°04′20″ --- 35°07′25″ N
Site area (km²)	42 km² Ramsar: 3,589 ha
Marine components	intertidal (sand and mudflat)
Year of establishment	2001-12-28
Geographic and habitat classification	- Maintaining wetland's primitive natural condition; - Achieving recognition form of tidal flat and biodiversity as its clean environment; - Able to observe cycle of creation and destruction of tidal flats worth geological preservation
Physical features	
Conservation status	National
Regulatory frameworks	
Administration Responsible ministry or agency	Ministry of Oceans and Fisheries
Management Management authority	Mokpo Regional Maritime Affairs & Port Administration
Legal framework Name of the law/regulation	Wetland Conservation Law URL : http://www.law.go.kr Comprehensive management plan in effect since 2002, implemented by the Ministry of Maritime Affairs and Fisheries (MOMAF)
Monitoring and Research	Monitoring on the Coastal Wetland Protected Areas (2008) Ecosystem monitoring in Muan tidal flat(2009~2015)
Key stress / managerial issues	Any negative effect from reclamation with small-scale sea dyke constructions at Woldoo village fishing port?
Key stakeholders	

involved in management	
Relevant network (international programmes)	Ramsar site (Jan 14, 2008) (as Muan Tidal Flat) https://rsis.ramsar.org/ris/1732?language=en
Reference in MPA database	
NOWPAP database[99]	
Protected planet[100]	
MPA global[101]	
Others	
Purposes and reasons of its nomination as target MPA	This area was nominated to prevent damage and promote sustainable nature use.
Contact point for NEAMPAN	Ministry of Oceans and Fisheries http://www.mof.go.kr/

MPA Profile 2

Item	Detail
Naturalness[102]	
Biogeographic importance[103]	- The tidal flats in Hamhae Bay are well developed on the both sides of main tidal channel with very gentle slope. Similar to other typical mud flats, tidal creeks are also well developed in their upper parts. - Based on core-sediment analyses, the Hamhae tidal flat can be classified into five characteristic sedimentary facies: homogeneous mud, homogeneous muddy gravel, massive mud rich in shell fragment, laminated mud and terrigenous mud.
Ecological importance[104]	- A total of 245 species of macrobenthos is recorded from Hamhae Bay, which consists of 70 species of polychaetes (34%), 82molluscs, 73 crustaceans, 8 echinoderms and 12 miscellaneous taxa. - The most dominant species is mud mussel (*Musculista senhousia*). Short-necked clam (*Ruditapes philippinarum*),

[99] http://dinrac.nowpap.org/NowpapMPA.php
[100] http://protectedplanet.net
[101] http://www.mpaglobal.org
[102] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[103] *Ibid.*
[104] *Ibid.*

	Polychaetes *Chone* sp. (Sabellaridae) and *Ilyoplax deschampsi* (brachyuran) are also recorded. - *Lumbrineris longifolia* (polychaete), *Heteromastus filiformis* (capitellid polychaete), *Ampithoe valida* (amphipod), *Grandidierella japonica* (amphipod) and *Laternula marilina* (bivalve) are observed as additional major dominant species. - A total of 47 species and the highest individual number of 12,837 are recorded in the survey of waterbirds in the Muan wetland. [Ramsar: 49 species of winter waterbirds / examples of endangered and rare species: Saunder's Gull (Larus saundersi), Black-faced spoonbill (Platalea minor) and Chinese Egret (Egretta eulophotes)] - The highest individual number of dominant species is 6,807 of Common Shelducks (53.03%) observed in the winter of 2009, and that of the second one is 1,237 of Kentish Plovers (9.04%) in the autumn of 2008.
Economic importance[105]	- 52.4% of the residents expected their income growth from the opening of Muan Eco-Tidal-Flat Center. - Muan residents were very much interested in tidal-flat eco-tourism programs that can lead to increasing their income
Social importance[106]	
Scientific importance[107]	
International or national significance[108]	
Practicality/feasibility[109]	- The 64.6% of people answered that the designation of Muan tidal flat as a Wetland Protected Area was "appropriate," while the 81.5% of people working in fisheries (32.2% of decrease and 49.3% of no change) thought no direct linkage between income growth and designation of Protected Area.

[105] *Ibid.*
[106] *Ibid.*
[107] *Ibid.*
[108] *Ibid.*
[109] *Ibid.*

2. Suncheon Bay Wetland Protected Area

MPA Profile 1

Item	Detail
General information	
Country	Republic of Korea
Name of the MPA	Suncheon Bay Wetland Protected Area
Local name (in national language)	순천만갯벌
Location	Suncheon-si, Jeollanam-do, Republic of Korea • NEAMPAN (by ROK SC members) Latitude: 34°49′03″ -34°50′36″ N Longitude: 127°25′00″ -127°32′32″ E • Ramsar Information Sheet Latitude: 34°47′16.24″N - 34°48′ 40.22″N Longitude: 127°23′24.28″E - 127°25′41.05″E 34°48'0"N & 127°24'0"E  • Suncheon Bay website Latitude: Up to 34°52′30″N Longitude: 127°25′00″E - 127°32′30″E
Site area (km²)	28 km² - Ramsar Site: 3,550 ha (consisting of a wide estuary tidal flat of 2,160 ha and a reed community of 140 ha located 3.5 km downstream of Dong Stream and Esa Stream confluence - Total area: 75 km²; total tidal flat: 22.6 km²;
Marine components	intertidal - Ramsar site: Intertidal flat (largely muddy) and intertidal marsh (with reedbed and *Suaeda Japonica* salt marsh)
Year of establishment	31 December 2003
Geographic and habitat classification	- The only place being an inhabitation and a sanctuary for Hooded Crane - Superb natural landscape with *phragmites communis* community - Benthic invertebrates: 5 phyla, 6 classes, 12 orders, 22 families, and 43

	species - Flora (summer halophytes): 36 families, 92 genera, and 116 species (such as *Phragmites communis, Zoysia sinica, Avena fatua, Atriplex subcordata, Typhaceae spp, Suaeda japonica, Phacelurus lalifolius, Erigeron bonariensis, Suaeda asparagoides, Limonium tetragonum)* - Birds: 8 orders, 22 families, and 73 species (Feb1999~Jan2004: 34,961 individuals recorded in total; 9,847 individuals on average) - Dominant species: *Charadrius alexandrinus* (11,000 individuals), *Calidris alpina* (4,330 individuals), *Tadorna tadorna* (3,186 individuals), and *Larus ridibundus*(2,043 individuals) - Rare bird species (13): *Platalea leucorodia*, *Cygnus Cygnus*, *Cygnus columbianus*, *Buteo buteo*, *Circus cyaneus*, *Falco peregrinus*, *Falco tinnunculus*, *Grus grus*, *Grus monacha*, *Grus vipio*, *Haematopus ostralegus*, *Numenius madagascariensis*, and *Larus saundersi* - Species counted 1% of the world's total population: *Tadorna tadorna*, *Charadrius alexandrinus*, *Numenius arquata*, *Grus monacha* and *Larus saundersi* Inhabiting fishes : 4 orders, 6 families, 8 genuses, 21 species
Physical features	Origins: Natural Water quality: Salinity: 1.20~ 31.09 ‰ Dissolved Oxygen: 4.91 ~11.77 mg/l (mean : 7.08 mg/l) pH: 7.77~8.35 (mean. 8.09) COD: 1.67~6.16 mg/l (mean: 2.93 mg/l) SS (suspended solids): 9.2~130.0 mg/l (mean : 64.5 mg/l) Water depth: 0 ~ 7 m Water permanence: impermanent (tidal mudflat) Tidal range: 1.5~ 4.0 m General climate: Air temperature: mean 13 ^{o}C (-10~+32^{o}C) Precipitation: 1,800 mm Air pressure: 1,017 mmHg Climate of the bay - Temperature: annual average 12.5 ^{o}C, with minimum -6.4 ^{o}C and maximum 33.4 ^{o}C - Precipitation: 1,754 mm per annum (average precipitation of the last 5 years) - Relative humidity: annual average 70% Influx water quality: most streams are from good conservation areas and that makes little changes in water quality Dong-Chun (river) and Yisa-Chun flow through Suncheon City and rice fields into the northern part of the bay. The northern part of Suncheon Bay has over 500 ha of reedbed and extensive areas of Suaeda japonica salt marsh. Tidal-flats, largely muddy, shallow salt marshes and rice

	fields support a large number of birds and benthos. The bay is an indented coast located between Yeosu and Koheung peninsula. Around the bay are undulating hills with fishing and agricultural villages and numerous islands, e.g., Chang-do, Changu-do, Yeoja-do, Wonju-do, Nang-do.
Conservation status	Ramsar site and its surrounding area: state-owned
Regulatory frameworks	
Administration Responsible ministry or agency	Ministry of Oceans and Fisheries URL: http://www.mof.go.kr/
Management Management authority	Yeosu Regional Maritime Affairs & Port Administration
Legal framework Name of the law/regulation	Wetland Conservation Law Wetland Protected Area (31Dec2003) by MOMAF under the Wetland Protection Act and an Enforcement Ordinance Basic Management plan for Suncheon Bay (2006)
Monitoring and Research	- Korean National Long-Term Ecological Research at Suncheon Bay (2010-2013) - Monitoring on the Coastal Wetland Protected Areas (2009) - Winter Bird Simultaneous Census (1999-2004), MOE and National Institute of Environment Research - Wintering Status Survey of Natural Monument Birds (2000-2001), Cultural Property Administration - Management plan every 5-year: Ecosystem survey and citizen monitoring / domestic and international symposium and international exchange / public participation through eco-village building - Business review: Suncheon Bay Natural Ecosystem Committee
Key stress / managerial issues	Potential threat within the Ramsar site: - Expansion of the adjacent cities (requires more sewage and wastewater treatment facilities) - Changes in natural ecosystem (climate, erosion, etc.) - Potential development of privately-owned land around the bay
Key stakeholders involved in management	
Relevant network (international programmes)	Ramsar site (Jan 20, 2006)
Reference in MPA database	

NOWPAP database[110]	Suncheon Bay Tidal Flat Marine Protected Area (http://dinrac.nowpap.org/NowpapMPA/NowpapMPA_form_detail.php?id=69)
Protected planet[111]	Suncheon Bay Wetland Protected Area - Tidal Flat (WDPA ID: 365033) (http://www.protectedplanet.net/sites/Suncheon_Bay_Wetland_Protected_Area_Tidal_Flat)
MPA global[112]	Not included
Others	Ramsar site (https://rsis.ramsar.org/ris/1594) – Suncheon Bay(2006) IUCN category IV
Purposes and reasons of its nomination as target MPA	This area was nominated to protect the unique wetland.
Contact point for NEAMPAN	Ministry of Oceans and Fisheries http://www.mof.go.kr/

MPA Profile 2

Item	Detail
Naturalness[113]	
Biogeographic importance[114]	- Yeoja Bay is characterized as typical semi-enclosed bay with a narrow entrance to be widened toward middle bay. The streams show both straight and/or meandering patterns. - Similar to other typical mud flats, tidal creeks are also well developed in their upper parts.
Ecological importance[115]	- A total of 223 species of macrobenthos were recorded from the Yeoja Bay. - The major dominant species of macrobenthos were crustaceans, *Eriopisella sechellensis* accounting for 13% of total density, *Xenophthalmus pinnotheroides* (9%) and *Raphidopus ciliates*. - A total of 63 species and the highest individual numbers of 13,018 are recorded in the survey of waterbirds in Suncheon bay wetland protected area. - Various halophyte communities (*Phragmites*, *Suaeda Japonica*, *Typha Latifolia* community, *Suaeda Asparagoides*, *Zoysia Sinica*, *Limonium Tetragonum* and etc.) are observed in Suncheon-bay. - (Information sheet on Ramsar Wetlands, 2006): 25 protected bird species, including 2 IUCN Redlisted Endangered species and 7

[110] http://dinrac.nowpap.org/NowpapMPA.php
[111] http://protectedplanet.net
[112] http://www.mpaglobal.org
[113] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[114] *Ibid.*
[115] *Ibid.*

	Vulnerable species, 14 CITES species, 24 MOE or Natural Monument Birds (Cultural Heritage Administration) Species - The only wintering site for *Grus monacha* in ROK: observed number 79~201 (1999~2004, MOE and National Institute of Environment Research), for foods on agricultural land close to the Bay - 5 migratory waterfowl species counting over 1% threshold of the entire world population (Common Shelduck, Kentish Plover, Eurasian Curlew, Hooded Crane, and Saunders' Gull)
Economic importance[116]	Current recreation and tourism (2006) - Suncheon Bay Natural Eco-park (Hawpo and Waon region) - Suncheon Bay Visitor Centre (Nov 2004~) o Location: 162-7, Daedae-dong, Suncheon City o Size: 3-story building (total area of 1,772 m²) o Parking lot: 2,476 m² (accommodating 155 vehicles) - Mudflat experience site, observation hides for birder and boardwalk (2 places) o Walk: Yongsan hill boardwalk (416 m), Changsan boardwalk (180 m), sea road (waterfront street, 4 km) o Observatory: Yongsan hill observatory in construction - Bird watching by boat (4 boats) - Eco-tour program and Theme tour for people (Suncheon City) - Average annual number of visitors or tourists: 1 million (foreigners of 10%) per year - Fisheries (as of 2003): Fish 290 ton/year, Shellfish 1,279 ton/year, and others 152 ton/year Current land use (2006) - Within the Ramsar site: Fishing activities including culture o number of families and population in fisheries : 561 houses, 2,366 people o number of fishing boats : 282 boats o Most fishing boats are small-size (less than five tons), and used for fishing in coastal area (traditional fishing gear) o number of fishing ground for culture : 65 sites, 1,848 ha o species for culture: Anadarac tegillarca granosa, Scapharca subcrenata, Cyclina sine, Sinonovacula constricta, Crassotrea gigas o stationing zoning fishery: 210 sites o mobile zoning fishery: 32 sites - land use of the surrounding area o target area : the area of 7 ㎢ surrounding the Suncheon bay o land use:

[116] *Ibid.*

	- upland field 2.660 ㎢ (38%), rice paddies 0.393 ㎢ (5.6%), forest 1.064 ㎢ (15.2%) - salt pan 0.735 ㎢ (10.5%), residential area 0.21 ㎢ (3.0%), and bare land 0.224 ㎢ (3.2%), etc. - Fishing activities o Major products include polychaetes, small octopus (*Octopus variabilis*), short-necked clams (*Tapes Japonica*, *Paphia undalata*), natural oysters, flat oyster (*Ostrea denselamellosa*), purple shell (*Rapana venosa*), *Acanthogobius flavimanus* and *Boleophthalmus pectinirostris*. o 651 households and 1,333 persons engaged in fisheries of 3 towns; 142,127 tons of fisheries, 409,100 tons of seaweed, and 16,347 tons of mollusks o Yongdoo fishing village (2003): the total sales of razor clam reached about USD 0.8 million
Social importance[117]	As to the future use of tidal flats, the greatest number of respondents found 0.8 million 409,100 tons of seaweed, and 16,347 tons of mollusks d Crane, and Saundersrns, eg., Chang-do, Changu-do, Yeoja-do, Wonju-do, Nang-do.l-flats, largely muddy, shallr fishery'. Social and cultural values: beautiful sceneries with natural and cultural heritages,
Scientific importance[118]	- The only site in Korea where Grus monacha arrives regularly and such endangered waterfowls as Ciconia boyciana and Platalea minor arrive - Habitats to various migratory birds including Tadorna tadorna, Charadrius alexandrinus and Anas platyrhynchos - Internationally important area for connecting East Asia and Australia along the flyways of migratory birds
International or national significance[119]	Designated Ramsar site
Practicality/feasibility[120]	- 67.3% of the total survey participants find the designation of tidal flats in Suncheon Bay 'appropriate', where as only 4.6% reported finding designation 'inappropriate'. - Survey shows that 55.6% of the respondents are aware of the designation of the tidal flats in Suncheon Bay as Wetland Protection Areas.

[117] *Ibid.*
[118] *Ibid.*
[119] *Ibid.*
[120] *Ibid.*

MPA PROFILES-RUSSIAN FEDERATION

1. Far-Eastern State Marine Biosphere Reserve (FEMBR)

MPA Profile 1

Item	Detail
General information	
Country	Russian Federation
Name of the MPA	Far-Eastern State Marine Biosphere Reserve (FEMBR)
Local name	Дальневосточный государственный морской биосферный заповедник (ДВГМБЗ)
Location	Primorsky Krai - The southern part of Primorsky Krai at the coast of the Sea of Japan/East Sea - The western part of the Gulf of Peter the Great in the zone of active tectonic movements of the crust Eastern area - Latitude: 42°35′00" - 42°42′00" N - Longitude: 131°12′80" - 131°30′00" E Southern area - Latitude: 42°28′50"- 42°33′70" N - Longitude: 130°45′80" - 130°57′50" E Western area - Latitude: 42°35′50" - 42°36′70" N - Longitude: 130°50′70" - 130°52′12" E
Site area (km²)	63,000 ha (64,316 km²) - UNESCO-MAB: 121,000 ha o Core: 900 terrestrial and 45,000 marine o Buffer: 200 terrestrial and 15,000 marine o Transition: 15,000 terrestrial and 68,000 marine ▪ The core areas and buffer zone are protected as the Far East State Marine Reserve while the transition area lies mainly along the coast.
Marine components	Marine/intertidal/subtidal (MPAglobal[121])
Year of establishment	1978
Geographic and habitat classification	A characteristic feature of the climate is the lowest annual temperature, stable monsoon winds and periodic cyclones. As a result, the Reserve waters in winter in temperature regime are similar to the Arctic and in summer to subtropical.
Physical features	Consisting of 11 islands, the Reserve is located off the continental coast

[121] http://www.mpaglobal.org/home.html

	south of Vladivostok, where boreal and sub-tropical currents meet. The coastal areas consist of a combination of rocky abrupt capes, small peninsulas and bays, with coniferous and deciduous forests inland. The Reserve incorporates isles Bolshoy Pelis, after Mateveev, De Livrone, Guildebrandt, Stenin, Durnovo, Furugelma, Veryi, cape Ostrovok Falshiviy, with total area of approx. 1,100 ha and southern part of isle of Popov (Cape Likander and area adjacent from the north) of area of 216.3 ha. There is a marine protected zone of 3 miles width around the maritime borders of the Reserve. Also, there is the protective zone on land as a strip of 500 meters width along the land borders of the Reserve. The water areas are represented with three parts: Eastern (isles De Livrone, Guildebrandt, Durnovo, Mateveev, Bolshoy Pelis), Southern and Western (isle Furugelma, cape Ostrovok Falshiviy). There are areas with low salinity. As a result of a combination of different types of flows and complex orography in the bays of islands, there are very complex hydrological conditions.
Conservation status	The Reserve consists of the 4 zones. 1. The zone of complete protection is the largest Eastern area (45,000 ha of water area and 900 ha of land area). Any organisms are prohibited for exclusion/introduction here. There are cordons constructed in the protective zone of Srednia and Spasenia Bays, with inspectors living there and scientists performing research activities there. 2. The Southern area (15,000 ha of water area and 200 ha of land area) is restricted to the special authorization of the Reserve administration for making still and video photography, scientific researches related to the development of grounds for conservation and restoration of marine communities, monitoring, and inventory of population. 3. The Western area (3,000 ha of water area) is aimed, along with conservation of natural communities, at the development of biological grounds for mariculture, with almost 100 ha farm organized to collect larvae and growing of fry of Japanese scallop for replenishment and restoration of natural populations within the Reserve. 4. The excursion and outreach related Northern area of the Reserve occupies 216.3 ha in the southern part of the Isle of Popo, with the hotel, museum named “Nature of the Sea and its Protection”, ecology educational center, and botanical garden of the Reserve.
Institutional	The Reserve area incorporates several permanent protective cordons,

arrangement	while seasonal points are operative at all islands in spring and summer periods. It is intended that the ancillary, yet significant part in the protection of the reserve, will be played as the buffer zone in the form of the currently drafted Marine Park in the Peter the Great Gulf. 4 natural monuments covered with the Reserve protection regime - Golubiny Utios - Sopka Sudar - Part of Ogorodnaya Lagoon and Bolshoye Krugloye Lake - Isles after Verkhovsky and Karamzin
Regulatory frameworks	
Administration Responsible ministry or agency	From FAB RAS authority to the Ministry of Natural Resources and Environment of the Russian Federation (under the transition) - The Reserve, headed by the Director, is a multifunctional entity with clearly determined goals, priorities and activity directions. - Each of the activity directions is implemented by the structural subdivision of the Reserve, including the division of protection, scientific division, ecological education division, group for major works. URL: http://www.mnr.gov.ru/english/
Management Management authority	
Legal framework Name of the law/regulation	
Monitoring and Research	
Key stress / managerial issues	Over-exploitation of marine and recreational resources resulted in drastic decline in a number of species, which in its turn could lead to alteration of communities and food chains, destruction and/or degradation of habitats, fragmentation of ranges, loss of nutritive base, and introduction of alien species Pollution of coastal and sea area with industrial runoff, oil spills and solid wastes, including marine litter Poaching and illegal trade of marine and coastal resources, unorganized and/or illegal tourism
Key stakeholders involved in	

management	
Relevant network (international programmes)	UNESCO-MAB (2003)
Reference in MPA database	
NOWPAP database[122]	Far Eastern State Marine Nature Biosphere Reserve (http://dinrac.nowpap.org/NowpapMPA/NowpapMPA_form_detail.php?id=1)
Protected planet[123]	Dalnevostochny Morskoy / Far East Marine (WDPA ID 1710) (http://www.protectedplanet.net/sites/Dalnevostochny_Morskoy_Far_East_Marine_Zapovednik)
MPA global[124]	Dalnevostochny Morskoi / Far Eastern (http://www.mpaglobal.org/index.php?action=showMain&site_code=1710)
Others	UNESCO-MAB (http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?code=RUS+31&mode=all)
Purposes and reasons of its nomination as target MPA	1. The Reserve in its goals and objectives is a specialized marine reserve. 2. In its status the Reserve is biosphere, and is implementing international cooperation within the network. 3. The Reserve incorporates various types of ecosystems including terrestrial, marine and insular. The specific significance in the Reserve is paid to studies of insular ecosystems. 4. The Reserve is located in the zone exposed to enough strong anthropogenic impact, including the oil transportation. (NEAMPAN) The most important objective of the biosphere reserve is to preserve the important marine biodiversity (as a repopulation area for open sea fisheries), while at the same time improving the socio-economic conditions of local populations. The latter is to be achieved through ecologically friendly forms of nature use, such as eco-tourism, aquaculture, deer farming, crafts and sustaining hunting. (UNESCO-MAB)
Contact point for NEAMPAN	A. N. Malyutin Far East Marine Biosphere Reserve 17 Palchevsky Street 690041 Vladivostock City, Primorsky Krai

[122] http://dinrac.nowpap.org/NowpapMPA.php
[123] http://protectedplanet.net
[124] http://www.mpaglobal.org

	Russian Federation Tel: (7. 4232) 310 915 Fax: (7. 4232) 310 915 E-mail: a_malyutin@mail.ru (source: UNESCO-MAB)

MPA Profile 2

Item	Detail
Naturalness[125]	The extent to which the area has been protected from, or has not been subject to human-induced change
Biogeographic importance[126]	- Rare biogeographic qualities - Representative biogeographic type(s) - Any unique or unusual geological features
Ecological importance[127]	The Reserve biodiversity is connected with the coastal part of the Bay with littoral (tidal zone) and sub-littoral zones, which are characterized with the certain species of animals and plants, such as, - littoral zone: small crustaceans and wingless insects - sub-littoral zone: bottom vegetation and organisms o the most typical plant communities: kelp, dichloria and other algae (the algal vegetation near the coasts facing the continent is different from vegetation seaward of coasts) Overall, more than 3,000 species of invertebrates and vertebrates (both marine and terrestrial) are represented. **Bird species** - The riches in the Russian Federation in terms of the number of bird species: approx. 340 - A major location along the East Asian Flyway - Most are migratory, wandering and wintering birds; breeding species are relatively few **Fish species** - Approx. 60%: shared by demersal and benthic fishes of boreal origin - 40%: shared by subtropical and tropical species - ex. hammerhead sharks, flying fish, tuna and others **Marine mammals** - Nothing special in species or in quantitative diversity

[125] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[126] *Ibid.*
[127] *Ibid.*

	- Only one seal species, Larga seal (or spotted seal), permanently inhabits the area. - Other species are migratory: ex. gray whale (*Eschrichtius robustus*) and blue whale (*Balaenoptera musculus*), and dolphin **Vegetation of the Reserve islands** - Most plants are typical for the sea climate, including endemics - The yew and dwarf larch remained at the islands from coniferous. - A characteristic feature of the islands vegetation is multi-stemmed vegetation and stunted trees, as well as the presence of large lianas (*Actinidia* and grapes). **Zooplankton at the Peter the Great Bay** - dominant species: crustaceans, ctenophores and jellyfish - gastropods and bivalves are most numerous - The largest starfish (*Evasterias retifera f. tabulata Djakonov*) is reported at the top of the seaward part of the islands. **Others** - Phytoplankton inhabits upper layers of the water column, which are mainly represented by diatoms. - A lot of mussels, sea urchins and stars are in the open areas of the coasts, on a rocky soil. The species listed in the **Red Book of Russia** registered in the Reserve include: - 10 marine invertebrates species: 1 species of brachiopods, 7 species of mollusks, 2 species of crustaceans; - about 60 species of birds: ex. spoonbill, Chinese egret, little Petrel were, Amur bittern, white-tailed eagle, Steller's sea eagle, peregrine Falcon, black vulture, far Eastern Curlew and others; - marine mammals: ex. small killer whales, porpoise, and SEI whale (Evsevy whale); and - 62 species of plants
Economic importance[128]	Existing or potential contribution to economic value by virtue of its protection (ex. protection of an area for recreation, use by traditional inhabitants, appreciation by tourists and others)
Social importance[129]	Existing or potential value to the local, national or international communities because of its heritage, historical, cultural, traditional aesthetic, educational or recreational qualities
Scientific importance130	Value for research and monitoring

[128] *Ibid.*
[129] *Ibid.*

International or national significance131	Any potential to be listed on the World or a national Heritage List or declared as a Biosphere Reserve or included on a list of areas of international or national importance or is the subject of an international or national conservation agreement
Practicality/feasibility132	- Degree of insulation from external destructive influences: While the core area is uninhabited, some 15-20 people live in the buffer zone in summer and some 30,000 live in the transition area. (source: UNESCO-MAB) - Social and political acceptability - Degree of community support - Accessibility for education, tourism, recreation compatibility with existing uses, particularly by locals - Ease of management - Compatibility with existing management regimes

[130] *Ibid.*
[131] *Ibid.*
[132] *Ibid.*

2. Sikhote-Alin State Natural Biosphere Reserve

MPA Profile 1

Item	Detail
General information	
Country	Russian Federation
Name of the MPA	Sikhote-Alin State Natural Biosphere Reserve after K. Abramov
Local name	Сихотэ-Алинский государственный природный биосферный заповедник им. К.Г. Абрамова (Сихотэ-Алинский заповедник)
Location	Terneisky and Krasnoarmeisky districts of Primorsky krai Main part of the Reserve: e.l. 135°48′46" - 136°34′23", n.l. 44°49′13" - 45°41′25". The Abrek Hole: e.l. 136°40′14" - 136°46′51", n.l. 45°02′53" - 45°09′38".
Site area (km²)	Total area: 401,428 ha, including 2,900 ha of aquatic area The Reserve area consists of two parts: main area of 397,400 ha and isolated area – Abrek hole of 4,200 ha. Both parts include the reserved water area of the Sea of Japan with total area of 2,900 ha. The Reserve has the core of 401,600 ha (4,014 km²), including 2,900 ha of marine area in the Sea of Japan, buffer (protective) zone of 67,660 ha (including 5,110 ha of the Sea of Japan area), and cooperation zone of 1,019,340 ha (10,193 km²).
Marine components	According to the MPA global[133], marine/intertidal/subtidal
Year of establishment	February 10, 1935 The aquatic area of 2,900 ha in the Sea of Japan is covered under the protection regime since 1991. Inclusion of the marine area into the Reserve in 1991 has significantly decreased the threat to marine and coastal ecosystems of the Reserve. But the significant and important part of marine area adjacent to the Reserve was not included.
Geographic and habitat classification	It is situated in the eastern and central watershed parts of the Sikhote-Alin ridge with the heights of 600 through 1,000 m above sea level, with the highest peak mountain Glukhomanka – 1,598 m. According to the physical-geographical zoning scheme, the Reserve is located within the Sikhote-Alin mountain area, which is part of the

[133] http://www.mpaglobal.org/home.html

	Amur-Primorie country. Area of the Reserve is located at the junction of three provinces: Central Sikhote-Alin, West Sikhote-Alin, and East Sikhote-Alin. The Reserve's climate has a distinct monsoonal character, which manifests itself in sharp contrary change of wind direction in summer and winter. There are three zones distinguished: 1) The first one – coastal strip along the shore of the Sea of Japan of the 25 km width. The influence of the Sea is most highly expressed here. It is characterized with the large set of habitats, high diversity of ecosystems and species. The greatest population density is reported here and, therefore, the highest anthropogenic stress on the ecosystems. 2) The second one – the central part of the Reserve and adjacent areas of the Sikhote-Alin eastern slopes. It is subject for the lowest sea impact and is characterized with the lower level of ecosystems and species diversity. 3) The third one – the northern part of the Reserve and adjacent areas of Sikhote-Alin western slopes. This zone has features of continentality, is protected by the Sikhote-Alin ridge against the Sea of Japan, and is characterized with less diversified ecosystems and the lowest species diversity.
Physical features	Coastal landforms, bathymetry, tides, salinity and turbidity, geology, dominant current, freshwater inputs, etc.
Conservation status	Jurisdiction and present ownership, degree and nature of threats, etc.
Institutional arrangement	The Reserve centre consists of administrative and laboratory building, building for informational centre for nature protection, garages, boiler house and barns, and is located in the town of Ternei in 1.5 km from the sea coast. The protection of land and marine areas of the Reserve is performed by the state inspectors on the Reserve protection. The Reserve also incorporates the system of paths, fire-prevention utilities and paths, wintering huts, specialized scientific and outreach routes and sites etc. The eco-tourism is based on the system of field bases (cordons and huts) and eco-paths located directly close to these bases. The Reserve is able to provide organization and implementation of protection of natural areas in order to conserve biodiversity and maintain natural state protected natural complexes and objects of the

	Central Sikhote-Alin. Also the Reserve performs the organization and conduct of scientific research and work, including maintenance of the Chronicles of Nature; implementation of environmental monitoring; environmental education and awareness; assistance in the training of scientists and experts in the field of environmental protection.
Regulatory frameworks	
Administration Responsible ministry or agency	The Reserve is under the authority of the Ministry of Natural Resources and Environment of the Russian Federation. It is headed by the Director. URL: http://www.mnr.gov.ru/english/
Management Management authority	The protection of natural complexes and sites in the Reserve land and water area, its protective zones is performed by the Special state inspection on the protection of the Reserve, which incorporates the Director of the Reserve who acts as the Chief State Inspector.
Legal framework Name of the law/regulation	Resolution of the Governor of Primorsky krai № 93 (March 5, 1997): the area of protected zones of the Reserve on land was significantly increased and the protective zone for maritime parts of the Reserve was established for its marine parts, including those ones where marine protective zone was lacking Provision on the Protective Zone: the norm that the commercial catch of marine bio-resources could take place in the Reserve's protective zone upon the authorization of the Administration of Primorsky krai
Monitoring and Research (any monitoring programme)	
Key stress / managerial issues	The increase of anthropogenic impact on the protected marine ecosystems of the Reserve is observed, such as the pollution of coastal and sea area with industrial runoff, oil spills, and solid wastes, including marine litter. Thus, the enough large village, Ternei, is located in the lower reaches of the Serebrianka river. During periodic rises in water level in the river and floods in the summer and fall period the river brings the domestic waste to the sea, which litters the sea and its coast for 20 km, including the Reserve areas. Poaching and illegal trade of marine and coastal resources, unorganized/illegal tourism is also among the factors of adverse effect on the Reserve ecosystems. Over-exploitation of marine and recreational resources results in decline in a number of species, alteration of communities and food chains, degradation of habitats, fragmentation of ranges, loss of nutritive base, introduction of alien species.

Key stakeholders involved in management	
Relevant network (international programmes)	In 2005 the Reserve area named 'Central Sikhote-Alin' was included into the UNESCO World Heritage List as the site, which includes the most important or significant natural habitats for conservation of biodiversity, including endangered species of exceptional global value from the scientific and conservation point of view.
Reference in MPA database	
NOWPAP database[134]	K.G. Abramov Sikhote-Alin State Nature Biosphere Reserve (http://dinrac.nowpap.org/NowpapMPA/NowpapMPA_form_detail.php?id=3)
Protected planet[135]	Sikhote-Alinsky (WDPA ID 1695) (http://www.protectedplanet.net/sites/Sikhotealinsky_Zapovednik)
MPA global[136]	Sikhote-Alinsky (http://www.mpaglobal.org/index.php?action=showMain&site_code=1695)
Others	
Purposes and reasons of its nomination as target MPA	1. The Sikhote-Alin Reserve being the biosphere reserve is active in international cooperation among the biosphere reserves of Russia, USA, and Japan, which have marine areas, and has the extensive data base on the relevant studies, including the chronological series. 2. The Reserve is located in the 'land-sea' contact zone what is determined by interaction of terrestrial and marine ecosystems. 3. From the point of view of bio-geographic patterns manifested here its location could be considered as a node one; it is representative with respect to the natural complexes of this landscape area in general. 4. The richness and diversity of ecosystems of the Sikhote-Alin Reserve is amplified due to the fact that its territory extends to both the eastern and the western slopes of Sikhote-Alin, significantly different in natural conditions, and also due to a significant difference in heights and proximity to the sea. The high etalon value of the Reserve is determined by the inclusion of low-altered natural landscapes and neighboring to areas experiencing the anthropogenic stress. Coastal area and waters are characterized with exceptional uniqueness of

[134] http://dinrac.nowpap.org/NowpapMPA.php
[135] http://protectedplanet.net
[136] http://www.mpaglobal.org

	flora and fauna, with a high proportion of rare endemic and relict species. The specific brackish habitats are formed at the junction of the mixture of salt and fresh continental waters: mineralized lakes, limans (coastal salt lakes), lagoons, and estuaries of rivers. Brackish waters also serve as a place for "physiological sluicing" of the most commercially valuable anadromous commercial fish species, such as sturgeons and salmons. Their adaptation to changing conditions of salinity and osmoregulation is taking place here. Compared to other brackish water complexes of Siberia and the Russian Far East, the inhabitants of estuaries and lagoons of the basin of the Sea of Japan are characterized with high species diversity.
Contact point for NEAMPAN	Postal address: 44 Parizanskaya street, Ternei vil., Primorsky krai 692150

MPA Profile 2

Item	Detail
Naturalness[137]	
Biogeographic importance[138]	
Ecological importance[139]	The unique natural complexes of coniferous-broadleaf forests of the Central Sikhote-Alin are under the conservation in the Reserve, as well as are ecosystems of the coast of the Sea of Japan and marine ecosystems. Some 95 percents of the Reserve area is covered with the forests. The following is reported in the Reserve: 1,076 species of vascular plants, 280 species of bryophytes, 434 lichen species, 670 algae species, 740 fungi species. The Reserve is inhabited by: - 61 species of terrestrial mammals, including 7 in the IUCN Red List; - 11 species of marine mammals, including 8 in the IUCN Red List (for instance, Dall's porpoise (*Phocoenoides dalli*), Killer whale (*Orcinus orca L.*), as well as Sakhalin sturgeon (*Acipenser mikadoi Ayres*), Sakhalin taimen (*Parahucho perryi Brevoort*), Czerski's sculpin (*Cottus czerskii Berg*).

[137] http://www.nacoma.org.na/Downloading/GuidelinesForEstablishingMPA_IUCN.pdf
[138] *Ibid.*
[139] *Ibid.*

	Over 350 species of birds (24 species are in the IUCN Red List); 8 reptile species, 32 fish species, 334 species of marine invertebrates and around 4,000 species of terrestrial invertebrates.
Economic importance[140]	
Social importance[141]	
Scientific importance[142]	
International or national significance[143]	In 2005 the Reserve area named 'Central Sikhote-Alin' was included into the UNESCO World Heritage List as the site, which includes the most important or significant natural habitats for conservation of biodiversity, including endangered species of exceptional global value from the scientific and conservation point of view.
Practicality/feasibility[144]	

[140] *Ibid.*
[141] *Ibid.*
[142] *Ibid.*
[143] *Ibid.*
[144] *Ibid.*