Convention on the Conservation of Migratory Species of Wild Animals
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Agenda item 5.1

PROGRESS REPORT ON THE INTERNATIONAL ACTION PLANS FOR THE CONSERVATION OF THE BLACK-FACED SPOONBILL (*PLATALEA MINOR*), SPOON-BILLED SANDPIPER (*EURYNORHYNCHUS PYGMEUS*), AND CHINESE CRESTED-TERN (*STERNA BERNSTEINI*)

(Prepared by Mr. Simba Chan, BirdLife International Asia Division)

I. Progress to March 2007

1. Preparation of the International Action Plans (IAP) for Black-faced Spoonbill, Chinese Crested-tern and Spoon-billed Sandpiper was unofficially started in late 2004, when BirdLife International Asia Division contacted experts on these species for their involvement in drafting the IAPs. As BirdLife International and its partners in Asia have been involved in conservation activities of Black-faced Spoonbill and Chinese Crested-tern, we believe it is best to have these two species IAP coordinated under BirdLife International Asia Division. On the IAP for Spoon-billed Sandpiper, BirdLife International approached the Shorebird Network of the Asia-Australasian Flyway for cooperation. They recommended Dr Christoph Zöckler, a Spoon-billed Sandpiper expert, to be the coordinator. BirdLife International had discussed with Dr Zöckler several times since 2004 and finally signed an agreement regarding the IAP after signing the Letter of Agreement with the CMS in early 2006.

Black-faced Spoonbill *Platalea minor*

2. Drafting of the IAP for Black-faced Spoonbill goes on smoothly, with four working meetings between compilers who represent all major range countries (Japan, North Korea, South Korea, China including the island of Taiwan and the Hong Kong Special Administration Region) and workshop and symposia held in Tokyo, Tainan (Taiwan), Hong Kong and Ganghwa (South Korea):

Tokyo, Japan: 2-6 October 2005 Meeting during the BirdLife Asia Council Meeting and a workshop at the Korea University, Tokyo.
This was the meeting to establish the drafting team and plan for drafting and consultation.

Tainan, Taiwan (Province of China): 24 – 27 November 2005 during the meeting if the Waterbird Society Meeting.
This is a meeting mainly to invite comments and information from Taiwan. It was held at the biggest wintering ground of this species.

Hong Kong SAR, China: 16 – 18 January 2006. Workshop and symposium: Keeping Asia's Spoonbills Airborne.
This is the meeting that covered all range states and invite participation of many Chinese (mainland) scientists and officers to providing information and idea on the IAP.

Ganghwa, Republic of Korea: 4-7 June 2006 Black-faced Spoonbill Symposium: Public Awareness and Communication on the Conservation of Black-faced Spoonbill.
This is the meeting for the editors to check the first draft and get more involvement of scientists and conservationists from the Republic of Korea. It was held close to the breeding site of this species at the DMZ.

3. The consultation draft has received input and comments from experts in all range countries. It is ready for a wider consultation.

Spoon-billed Sandpiper *Eurynorhynchus pygmeus*

4. Drafting of the IAP for Spoon-billed Sandpiper commenced in early 2006, Dr Christoph Zöckler has provided a first draft for consultation and BirdLife International Asia Division is supporting him in bringing more Asian experts to be involved in the drafting and consultation process.

5. A workshop was held at Ban Kung Nam Resort, at the Inner Gulf of Thailand on 10 and 11 December 2006, with about 30 participants from all range countries but North Korea. Information was collected and important conservation issues discussed. The first draft was revised to the present final consultation draft.

Chinese Crested-tern *Sterna bernsteini*

6. Drafting of the IAP for Chinese Crested-tern started from May 2006 when the compilers met in Hangzhou, China. This species is relatively poor in information as it had not been rediscovered until 2000. Most updated information has been obtained from researchers and local government agencies of both China mainland and Taiwan. A workshop in Taipei has been planned in June 2007 for promotion of a higher awareness of this IAP and the conservation issues on this species.

7. The three action plan final drafts for consultation have basically finished, only some minors gaps needed to be filled (which are highlighted in colours in the draft) and language editing needed. The consultation drafts are attached with this report to the Scientific Council of CMS for comments on the format and style.

II. Plan for the publication

8. Once comments are received and incorporated into the drafts they will be posted on BirdLife International Asia Division's website to invite wider consultation.

9. The availability of the drafts of the action plans will be announced through mailing lists of the Oriental Bird Club and Asia-Pacific Migratory Waterbird Flyway. National coordinators of the action plans will also distributed the information through their national network on migratory bird conservation.

10. At the same time BirdLife will present the drafts to all range state governments for their input and encourage their endorsement. This will be done by the BirdLife Asia Division and BirdLife Partners in the range countries.

11. The consultation period is expected to be about 3 months. The final draft will be finished one month after the consultation period.

12. A suggested schedule to the publication of the action plans:

March – June 2007 Consultation period: On the website and directly approach range state government agencies and relevant organizations and institutions for their comments and endorsement.

July – August 2007: Finishing the final draft.

September 2007: Adoption of the Action Plans by the CMS.

October – December 2007: Publication and launch of the action plans.

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ANNEX 1

Action Plan for the Conservation of Black-faced Spoonbill (*Platalea minor*)

Consultation draft

February 2007

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Executive Summary

(to be written after the final consultation)

I. Introduction

Probably no other bird species in Asia has the interesting conservation history as that of the Black-faced Spoonbill[1]. Prior to 1990 it was only known to ornithologists and keen birders as an uncommon species with very little information. For the average people it is just another white long-necked and long-legged bird not unlike an egret. Therefore, it should not be surprising that local people felt amazed, some even furious, that conservationists took this species so seriously and proposed shelving a major industrial project at Chiku[2], Tainan in early 1990s.

At the 21st BirdLife International World Conference held in Rosenheim, Germany, August 1994, Asian partners of BirdLife International agreed on joint actions to conserve the Black-faced Spoonbill, which was evaluated as critically endangered with a known population of just a few hundred birds. As the result of that resolution, a workshop was organized in Taipei in January 1995 to draft an international action plan for the Black-faced Spoonbill. The action plan was published in September of the same year. Follow-up workshops on how to implement this Action Plan were organized in May 1996 (Beijing) and June 1997 (Tokyo). These meetings had started the international cooperation projects on the Black-faced Spoonbill all over its range.

By the end of the 1990s, the Black-faced Spoonbill had become one of the best known conservation stories in eastern Asia. Revisiting Tainan ten years after the conservation movement, one would be impressed by the change of local attitude to conservation of this species: From threatening (and even shooting in a few cases) the birds to taking pride of living by the biggest wintering ground of the Black-faced Spoonbill in the world. The main gathering site of the Black-faced Spoonbills to be reclaimed for industry is now protected and managed by three local organizations. Arguably it has become the best known bird and symbol of Tainan.

Perhaps it is not unfair to give the credit of such changes to the first action plan, and the effort of organizations all over the range to implement the action plan. Their effort has made the first action plan probably one of the best implemented action plans for a threatened species in Asia, if not globally. When the first action plan was drafted, the future of the Black-faced Spoonbill and sites of important were not secured and only a few hundred birds were known to exist. Now at least we feel confident that there is a real increase of population (judging from the current trend it may reach 2,000 birds by the end of this decade), and conservation status of some important sites have been improved. However, it is still regarded as Endangered and many sites are not protected or well-managed. There is still a lot to be done to ensure the long term survival of this species.

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1 Abbreviation 'BFS' is used in some part of the text in this action plan

2 Can also be transliterated as Qigu (Hanyu Pinyin system) or Cigu (Tongyong Pinyin system). Chiku has the biggest wintering population of Black-faced Spoonbills and was threatened by a proposed industry plant to be built on the roosting area of Black-faced Spoonbills.

In 2002 this species was added to the appendix of the Convention for Migratory Species (CMS). CMS takes great interest in developing conservation plans for three migratory birds in Asia. It is with the support of CMS we started to draft a second conservation plan for this species. In October 2005 a workshop was organized at the Korea University (located in Tokyo, Japan) and invited Black-faced Spoonbill experts from different range countries to form a drafting team. Workshops had been held in Hong Kong and Ganghwa (South Korea) in January and June 2006. The draft of this action plan has been widely circulated for comments and inputs from all range countries. The editors would like to express our gratitude to major contributors of information and ideas on North Korea and Vietnam: Professor Chong Jong-ryol of the Korea University and Mr. Nguyen Duc Tu of the BirdLife International Indochina Programme. Mr. Sergey Surmach (Institute of Biology and Soil Science, Russia), Dr. Chen Shuihua (Zhejiang Natural History Museum), Dr. Ma Zhijun (Fudan University, Shanghai), Mr. Yang Jin (Fujian Birdwatching Society) have provided valuable information and suggestions of actions for Russia and eastern coast of China mainland. We deeply appreciate the contribution of data and suggestions from Agriculture, Fisheries and Conservation Department of Hong Kong SAR, Carlo Custodio, Yuri Darman, Kadoorie Farm and Botanic Garden Corporation, Hong Kong, Kim Jin-han, Mike Kilburn, Paul Leader, Wai-hung Lee, Leung Va, Mike Leven, Liang Wei, Liu Bofeng, Colin Poole, Phil Round, Shan Kai, Elena Smirenski, Lew Young, Zeng Xiangwu and Zhang Guogan through written correspondences. Chen Zhihong, Jimmy Choi, Silvia Choi, Tom Dahmar, Dong Jiangtian, Amanda Haig, Kim Incheal, Kim Kyung-won, Katherine Leung, Liu Liang-li, Liu Yang, Shel Severinghaus, Bena Smith, Samson, So, Sunyoung, Bob Thompson, Chiachi Wang, Wang Qishan, Ying Wang, and Captain Wong have given their suggestions on what actions needed to be taken to conserve Black-faced Spoonbills at the workshop in Hong Kong in January 2006. We also feel grateful to xxxxxxxxxxxxxxxxxx who gave comments for improvement of the action plan. The Convention of Migratory Species, The Croucher Foundation and Environmental Campaign Committee, Hong Kong Bird Watching Society, Korea Federation for Environmental Movement funded workshops in Tokyo, Hong Kong and Ganghwa for drafting the action plans. The Korea University had given logistic support to the workshop in Tokyo and assisting consultation in North Korea. BirdLife network (partners, affiliates and programme office) in Japan (Wild Bird Society of Japan), Taiwan (Wild Bird Federation Taiwan), Hong Kong (Hong Kong Bird Watching Society) and Indo-china (BirdLife Indochina Programme) are all enthusiastically involved in drafting of the action plan. We would like to thank Carrie Ma for recording comments at the Hong Kong Symposium in January 2006, Sunyoung for her constant efforts in organizing activities on Black-faced Spoonbill conservation, Mike Crosby from giving support at the BirdLife Secretariat in Cambridge, Richard Grimmett, Noritaka Ichida and Lucia Severinghaus for their guidance in drafting the action plan. Last but not least, Cornelis ('Kees') Swennen has provided his wise and deep insight on Black-faced Spoonbill matters. The action plan would not be finished without their support.

We would like to dedicate this action plan in the memory of the late Dr. Kim Soo-il, the pioneer of

Black-faced Spoonbill study in South Korea. He kindly offered his help in compilation of the action plan but unfortunately passed away before work started.

II. Status

① International threatened status

The threatened status of Black-faced Spoonbill was not noted in the first International Red Data Book of birds (King 1981). It was listed as a threatened species in Birds to Watch: The ICBP[3] World Checklist of Threatened Birds (Collar and Andrew 1988) but no estimation of population or details of distribution known. It was regarded as Critically Endangered in the revised edition of Birds to Watch II six years later (Collar, Crosby and Stratsfield 1994) as more information had been available and threats to their wintering ground known[4].

In the late 1990s, when its status was re-evaluated by BirdLife International on compilation of Red Data Book of Threatened Birds of Asia, it was found that it could not meet the Critically Endangered criteria as the known population was higher than that of the early 1990s and threats to the wintering grounds seemed to be reduced. It was listed as Endangered (BirdLife International 2000; BirdLife International 2001) and the status has not changed to the date of publication of this Action Plan.

② Protection status

1. International

a. Convention of Migratory Species (CMS):

The Black-faced Spoonbill has been listed in the CMS Appendix I of the Convention of Migratory Species since 2002. It means the status of being in danger of extinction is recognized by the CMS and CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Besides establishing obligations for each State joining the Convention, CMS promotes concerted action among the Range States of many of these species.

b. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

It is not listed on the CITES appendices.

c. The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention):

As it is known as an internationally endangered species, several Ramsar Site have been designed because of their importance to its survival[5]. These includes Xuan Thuy

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3 International Council for Bird Preservation, the name of BirdLife International prior to 1994

4 BirdLife International compiles the global Red List of birds for the IUCN so the two red lists are identical

5 Dongzhaigang and Suncheon do not support more than 1% of the global population at the time of compilation of this action plan.

Natural Wetland Reserve (Vietnam 1988), Dongzhaigang (China 1992), Mai Po Marshes and Inner Deep Bay (Hong Kong 1995), Manko (Japan 1999), Yancheng National Nature Reserve (China 2002), Chongming Dongtan Nature Reserve (China 2002), Shankou Mangrove Nature Reserve (China 2002), and Suncheon Bay (Republic of Korea 2006)

d. Bilateral cooperation between range countries:

It is listed on the Appendix of the China-Japan Migratory Bilateral Agreement. Both countries have conducted projects in conservation of this species.

2. Regional/national

a. Russia

Birds other then listed Game Birds are protected in Russia. Black-faced Spoonbill has also enjoyed the special status of listed in the Red Data Book of Russia. It is also strictly protected by law in Primorsky Kray since 2005. The breeding site is protected by the Far Eastern Marine Nature Reserve.

b. China

i. Mainland

Listed as a Nationally Protected Species (Second Class) since 1989. Xingrentuo, the only breeding ground known in China, has been designated as a nature reserve. The following important migratory staging grounds and wintering grounds are also protected as nature reserves: Yellow River Delta, Yancheng, Chongming Dongtan, Gongping, Futian and Shankou. Yancheng, Chongming Dongtan and Shankou are designated as Ramsar Sites in 2002.

ii. Taiwan

Black faced Spoonbill was listed as Class I (highest priority) protected species on 23 December 1995. Under the Wildlife Conservation Act, 300 ha of the most important wintering ground of Black-faced Spoonbill at Tainan was protected as "Tainan County Tsengwen Estuary[6] north bank Black-faced Spoonbill Protection Area" on 1 November 2002.

iii. Hong Kong

Black-faced Spoonbill is protected by the Wild Animals Protection Ordinance, Chapter 170, Laws of Hong Kong.

The Mai Po and Inner Deep Bay Ramsar Site (listed in 1995) is managed by Agriculture, Fisheries and Conservation Department (AFCD). The core of living habitats of wintering Black-faced Spoonbill located within Mai Po Nature Reserve inside the Ramsar Site.

iv. Macao

[6] Also transliterated as Zengwen Estuary (Hanyu Pinyin System) or Zeng-Wun Estuary (Tongyong Pinyin System)

Black-faced Spoonbill is protected as a species under the General Regulations for Common Area (enacted in 2005 to replace former rules). In 2001, the Government of the Macao SAR declared two nature reserves: One (15 hectares) was a wetland site between Taipa and Coloane. The other was an intertidal coastal wetland (40 hectares) that extends from the coastal wetland on the south of the Lotus Flower Bridge to the wetland on the north of Taipa.

c. Korea

i. North Korea

All species of bird (except from some game species) are protected by law in North Korea. Black-faced Spoonbill is no exception to this. In addition, four islands that are important breeding grounds to the Black-faced Spoonbill have been designed as protected areas and Natural Monuments.

ii. South Korea

Designated as a Natural Monument number 205 on 30 May 1968 by the Cultural Heritage Administration. It is also listed as an endangered species (First level) by the Ministry of Environment. The islets of Chilsando were designated as National Monument Number 389 in 1997 after breeding of Black-faced Spoonbill was confirmed that summer. In 2000, the breeding ground at Bido and the Ganghwa mudflat (total area 37,068 ha) were designated as National Monument Number 419.

d. Japan

Black-faced Spoonbill is protected under the Wildlife Protection and Hunting Law (1919. Last amended in 2005) as most of the non-game species. It is also included in the Red List of Japan, which means that its conservation importance is recognized and it can be used a reference species in environmental impact assessment for development projects. Important wintering sites are protected by Natural Parks Law (1957. Last amended in 2006), Wildlife Protection and Hunting Law and Law for the Protection of Cultural properties (1950. Last amended in 2006). Manko in Okinawa Prefecture and Wajiro Tidal Flat (Higata) in Fukuoka Prefecture have been designated as protected areas and designation of Ariake-kai (Fukuoka and Saga prefectures) as protected area is under consideration. Manko has been designed as a Ramsar Site in 1999.

e. Vietnam

In Vietnam, Black-faced Spoonbill is listed as IB species, or species of strictly prohibition from exploitation and trading, by Decision No. 48-2002/ND-CP dated 22 April 2002. It is also ranked in the Red Data Book of Vietnam as Endangered. Two protected areas have been decreed for Black-faced Spoonbill: Xuan Thuy National Park and Tien Hai Nature Reserve.

f. Philippines

Black-faced Spoonbill is protected in the Philippines as birds listed on the IUCN threatened list are listed as protected species in the Philippines.

g. Cambodia

It is not listed as a protected species in Cambodia.

h. Thailand

With the exception of 60 species of birds, all birds are protected by law in Thailand that hunting of these species is forbidden. .Black-faced Spoonbill is not listed as one of those species allowed to be hunted.

III. Threat analysis

① Habitat loss

This is the highest threat to Black-faced Spoonbill throughout its range as tidal flat reclamation is severe along the coasts of Yellow Sea, East China Sea and South China Sea.

In its breeding grounds in northern China and Korea, reduce in tidal habitat and human disturbance is probably the reason why that BFS breeding sites are only to be found on small islands, particularly at the western coast of DMZ of Korea. In recent years proposal of construction of a new highway connecting North and South Korea threatens the tidal flat of Ganghwa Island and Yu-do, the island with the biggest known breeding population.

Along its staging and wintering grounds, much of tidal flats in Japan have been reclaimed. Remaining wetlands in Kyushu and Okinawa, where most of the wintering population in Japan occurs, are fragmented. In Korea and China mainland tidal flats are being reclaimed at large scale for agriculture, aquaculture, industrial and urban development. Chinese staging grounds at Yancheng, Chongming Island, Wenzhou Bay and Min Jiang Estuary are all under heavy development pressure. In Taiwan, constructing an international airport on Tainan and a local university campus near Chiku have been proposed at several occasions in recent years and these may reduce feeding grounds of BFS. The wintering ground in Macao, which holds more than 2% of the global population, may cease to exist within a few years if the present trend of construction (of casinos) continues. The biggest Korean wintering ground, Seongsanpo in Jeju Island, has been proposed to be developed into a marine resort. In Vietnam the wintering tidal flat is threatened by mangrove afforestation.

② Habitat degradation and pollution

Eastern Asia has the highest human density and fastest economic development in the world. That puts pressure to remaining wetland sites throughout the range of the Black-faced Spoonbill: tidal flats are fragmented by reclamation for agricultural and urban development, which generate domestic sewage, agricultural and industrial pollutants that pollute the remaining wetland sites. The second biggest wintering ground of this species: Inner Deep Bay in Hong Kong/Shenzhen is probably safe from major developments, but pollutants from nearby settlements and estates reduced food availability to the Black-faced Spoonbill. Site degradation and pollution is also a threat at many Chinese sites as the economical and industrial boom in coastal China. However, it is not regarded as a serious threat in South Korea and Japan.

The estuarine habitat is not a stable system, sedimentation will changes coastline and wetlands. If there is no more room for extension of present tidal flat, the site suitable to the Black-faced

Spoonbills may become less suitable in a number of years. Currently the sedimentation rate of Inner Deep Bay in Hong Kong/Shenzhen is high, favorable habitat may disappear as the tidal flat becomes dry land. The process of sedimentation will be hastened by mangroves afforestation.

③ Exploitation

Hunting is not a direct threat to the Black-faced Spoonbill in Japan, South Korea, Taiwan, Macao and Hong Kong. However, egg collection of seabirds and/or hunting activities are known to be serious problems in Russia, coastal China mainland and Vietnam. Although most are not targeted specifically to the Black-faced Spoonbill, such activities may still cause loss and casualty: One was shot in Russia in 1995, one found in a market in Guangzhou, China in 2000 (released by conservationist) and two birds were captured and killed at Yinggehai, Hainan Island in 2001 and 2002. There are probably more unknown and unreported cases of casualty in China and Vietnam. There is an unconfirmed report that some Black-faced Spoonbills had been collected in Shandong and sold to a zoo in China.

④ Disturbance

Fishery and shellfish collection in China mainland and Vietnam is serious as land use planning is not well developed at sites. In Hong Kong, Taiwan, Japan and South Korea degree of disturbance is moderate. However, in areas that birdwatching and photography become a popular hobby, disturbance from these leisure takers can be a potential problem to this species. Breeding sites are particularly vulnerable from photographers.

⑤ Others

Disease outbreak is the major threat for this congregated waterbird species. Botulism, although not an infectious disease, claimed the lives of 73 Birds at Tainan in 2002 and a few birds in Hong Kong in recent years. Unusual weather change causing avian botulism outbreak at major wintering site is still a threat to the species.

Wind farm turbines at sites along the migration could be a problem if they are not appropriately positioned.

Summary of level of threats to Black-faced Spoonbill over its range:

Legend:

Territories RU =Russia JP = Japan NK = North Korea SK = South Korea
NC = China mainland north of the Yangzte SC = China mainland south of the Yangtze including Hainan
HK = Hong Kong MA = Macao TN = Taiwan VN = Vietnam

Level of threat: N = Negligible ? = No information L = Low M = Moderate H = High

	RU	JP	NK	SK	NC	SC	HK	MA	TN	VN
Habitat loss	N	M	?	H	H	H	M	H	M	H
Habitat degradation	N	M	?	M	M	H	H	H	M	M
Pollution	N	L	?	L	M	H	H	H	M	M
Exploitation	H	L	?	L	H	H	L	L	L	H
Disturbance	?	H	?	M	H	H	M	H	M	H
Disease outbreak	L	M	?	H	M	H	H	H	H	H

More on threats to the Black-faced Spoonbill are posted the BirdLife International Red Data Book of Threatened Birds of Asia website:

http://www.rdb.or.id/view_html.php?id=279&op=platmino

IV. Conservation actions recommended

Acronyms of organizations:

AEC (HK)	Asia Ecological Consultants Ltd/ Hong Kong
AFCD	Agriculture, Fisheries and Conservation Department, Hong Kong SAR, China.
BLA	BirdLife International Asia Division
COS	China Ornithological Society
FJBWS	Fujian Bird watching Society
HKBWS	Hong Kong Bird Watching Society
JBFSN	Japan Black-faced Spoonbill Network
KFBG	Kaddorie Farm and Botanic Garden Corporation
KFEM	Korean Federation of Environmental Movement
KNIER	National Institute of Environmental Research, Republic of Korea
MOEJ	Ministry of the Environment, Japan
MOEK	Ministry of Environment, Republic of Korea
MONRE	Ministry of Natural Resources and Natural Environment, Vietnam
NBBC	National Bird Banding Center, China
RBCU	Russian Bird Conservation Union
SFA	State Forestry Administration, China
WBFT	Wild Bird Federation Taiwan
WBSJ	Wild Bird Society of Japan
WWFHK	World Wide Fund for Nature Hong Kong
XMBWS	Xiamen Bird Watching Society
YIO	Yamashina Institute for Ornithology, Japan
ZJBWS	Zhejiang Bird Watching Society

① Short-term objectives (within five years after publication of this action plan: from 2007 to 2012)

International

1. Improving legal protection status of Black-faced Spoonbills

To stop any possible trade of Black-faced Spoonbill, particularly to zoos and collectors. Also enhance the protected status by bilateral or multilateral agreements.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Agreements on conservation and joint projects between range states	Range countries should formalize an agreement on conservation of BFS on the CMS agreement model.	All range countries	Philippines: Severing as the link between CMS and the range countries as being the only BFS range state that has ratified the CMS	All other countries: Consider ratifying CMS or participating the actions as a non-member.	High
Listing BFS on the CITES	Propose to list BFS on the CITES	All range countries that have ratified the CITES	All range countries: Discuss listing of BFS to the CITES at the next Conference of Contracting Parties		High

2. Preventing habitat loss of the Black-faced Spoonbill.

This is important in preventing further concentration of Black-faced Spoonbills in the breeding and wintering grounds.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establishing protected areas	Sites will be specified in national recommendations. Important sites listed in Appendix I should all be either legally protected as protected areas, or protected through good land-use planning of the sites.	Relevant government agencies of all range countries. BLA and partners, research and other	Government agencies: Consider legal procedures on establishment of protected areas. BLA and partners, other research and conservation organizations: Assisting in information collection and recommendation of	Government agencies: Drafting management plans and staffing the protected areas to ensure good management practice	High

		conservation organizations.	the important sites.	at these sites. Other organizations: Assisting regular exchange of information and experience with other BFS sites	
Drafting land use guidelines for important sites	Organizing workshops to discuss drafting a good land use plan for buffer zones of protected areas or important sites that cannot be officially listed as protected areas.	Relevant government agencies of all range countries. BLA and partners, KFEM, JBFSN, WWFHK, and other conservation organizations.	Government agencies: Supporting the organization of the workshops. BLA and partners, KFEM, JBFSN, WWFHK and other conservation organizations: Fundraising and organizing the workshops.	Guideline distributed to all local stakeholders. Promotion activities to gain their support in implementation.	High
Drafting management plans at important sites	For sites that have not got a management plan, meetings should be called to invite all stakeholders to draft a management for conservation of BFS and their habitats	Relevant government agencies of all range countries. BLA and partners, and other conservation organizations.	Government agencies: Supporting and financing the drafting workshop and subsequent management measures. BLA and partners and other conservation organizations: Proving technical support in drafting the plans.	Government agencies: Implementation of the management plans at the sites BLA partners and other conservation group: Technical support in the implementation and provide best practice information.	High
Drafting monitoring plans at important sites	Drafting plans on regular monitoring and assessment of the environmental factors of all important sites. National or local workshop should be held on drafting the monitoring plans	Relevant government agencies of all range countries. BLA and partners, and other conservation organizations.	Government agencies: Supporting and financing the drafting workshop and subsequent monitoring projects. BLA and partners and other conservation organizations: Proving technical support and training in drafting the plans.	All: Deciding a database to the monitoring and how they could be used for conservation and management of the sites	High

3. Improving knowledge of migration and distribution of the Black-faced Spoonbill

Identify previously unknown sites and the importance of these sites during migration. Then these sites should be protected and/or well managed.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Satellite tracking	Satellite tracking of birds at the breeding grounds in South Korea to discover autumn migration route	MOEK, KNIER, YIO, WBSJ, JBFSN, NBBC, BLA	MOEK : approval and legal support, KNIER : facilitating the program YIO, WBSJ, NBBC : technical supports NBBC, BLA and partners : information coordination and distribution	KNIER, NBBC, JBFSN, BLA and partners (particularly WBSJ): communication with wintering sites identified. Proposal to national governments to designate protected areas.	High
	Track Black-faced Spoonbills for a one-year cycle	All organizations listed above and MOEJ, banding organizations in Taiwan.	National Government: approval and legal support YIO, WBSJ: technical advice and support National banding scheme and research organizations: facilitating the program and technical supports BLA and partners: information coordination and distribution	NBBC, BLA and partners: communication with wintering sites identified. Proposal to national governments to designate protected areas.	Moderate
	Satellite tracking of birds from Mai Po marshes (Hong Kong) in early winter to study any further movement along the south China coast and to Vietnam.	AFCD, WWFHK, HKBWS, AEC (HK), NBBC, YIO, BLA, WBSJ	AFCD : approval and legal support, facilitating the program WWFHK : facilitating the program HKBWS, AEC, NBBC, YIO, WBSJ : technical supports BLA: information coordination and distribution	YIO : searching for suitable device NBBC, BLA and partners : communication with wintering sites identified in China and Vietnam	Moderate
Survey for summer sites of immature birds	Distribution of promotion material to potential summer sites of immature birds (most likely in eastern and northern China)	SFA China, NBBC, KFEM, BLA and partners (esp HKBWS)	SFA China: approval and guidance of project SFA China, NBBC, HKBWS: Coordination of distribution of information. Promotion of the project. KFEM, BLA and partners: technical and information support	NBBC, HKBWS: Compilation of information and regularly contact potential sites. Preparation of follow-up surveys	High
	Site survey when information received	SFA China, NBBC, KFEM, BLA and partners (esp HKBWS)	SFA China: approval and guidance of project SFA China, NBBC, HKBWS: Coordination of site survey with local forestry bureaus and birdwatching societies.	NBBC, HKBWS, BLA: Recommendation of management and conservation of sites	High

Continue colour banding of pulli at breeding grounds	Dissemination of colour-banding protocol as printed material and on website.	All banding schemes	National banding schemes – notify all banding institutions and follow the internationally accepted scheme HKBWS: Coordinate on construction of a website for information dissemination	National banding schemes, BLA and partners: Discuss a good coordination system in colour-banded birds re-sighting reporting.	High
	Colour-banding of BFS pulli.	YIO, NBBC, KNIER and Russian banding scheme	YIO: Designing and coordination of colour banding protocol. Technical advice. NBBC, KNIER and Russian banding scheme: Study the risk of pulli banding, banding of pulli and dissemination of information.	YIO, NBBC, KNIER, Russian banding scheme and region banding schemes: Discuss problems and improvement of banding technique. Produce guidelines to banders	Moderate
Study historic distribution	Compare historic records on sightings and nesting with today's status	Ecosystem (HK)		Publish the findings in an international refereed journal.	Low

4. Biological studies

Age structure study is important as it reveals the population dynamics of the Black-faced Spoonbills. Breeding success and whether the population is increasing can be inferred. Other recommended studies will enhance our knowledge of this species and provide scientific information to species and site management.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Age structure study	a. find out age ratio of adult and non-adult birds in the population in all important wintering sites to understand breeding success and population trend of BFS	AFCD, NBBC, KNIER, KFEM, BLA and partners (esp WBSJ. WBFT, HKBWS, Indochina Programme), JBFSN, birdwatching organizations in China	BLA and Partners: Producing reference material on age identification. Provide training to local birdwatching organizations. NBBC, KNIER, KFEM, BLA and partners, JBFSN, birdwatching organizations in China: Conducting the study in important site	All: Discuss and decide a coordination system for information distribution.	High

	b. Detailed study on the changes of morphology with age in captive birds	Tama Zoo, Korea University, BLA and partners (esp. WBSJ)	Tama Zoo and Korea University: regular measurement of captive birds. WBSJ: Analysis of data and coordination of information.	BLA and partners: Publication of field identification leaflet/ manual	High
Study on the identification of sex in morphology	Measurement of captive birds of known sexes.	Tama Zoo, Korea University, BLA and partners (esp. WBSJ, WBFT)	Tama Zoo and Korea University: regular measurement of captive birds. WBSJ: Analysis of data and coordination of information. WBFT: Summarize data collected on birds died of botulism in 2002	BLA and partners: Publication of field identification leaflet/ manual	Moderate
Study salt tolerance of newborn BFS chicks in captivity	.Study whether newborn BFS can take salty food for understanding of foraging requirement of their parents	Tama Zoo, WBSJ	Tama Zoo : experimenting feeding salt water fish to chicks of different age WBSJ : analysis of result.	WBSJ: Confirming the salt tolerance of BFS chicks to breeding ground researchers KNIER, NBBC, Russian conservation groups, Nature Conservation center in DPRK : If freshwater food is required for chick rearing, identify the foraging grounds of breeding BFS in Russia, Korea and China	Moderate
DNA analysis	Analysis of fallen feathers, captive birds and trapped birds	Kyushu University, Korea University. BLA and partners	Kyushu University : analysis if DNA Others : assisting collection of fallen feathers	BLA and WBFT: Cooperation with Taiwan institutes that had done similar research on BFS died of botulism	Low
Intraspecific relationship with other birds	Study whether gulls are beneficial as watchdogs or harmful as predators at the breeding grounds	SFA, MOEK, KNIER, NBBC, Russian government and researchers, BLA and partners	SFA, MOEK, Russia: funding and legal support. KNIER, NBBC, other researchers: field studies and analysis of data	BLA and other research organization: Dissemination of results, start discussion on management of breeding grounds	High

	Study intraspecific relationship with other birds in the wintering grounds Discussion on the study that could involve amateur birdwatchers to collect information.	Research organizations at wintering grounds, BLA and partners	BLA partners, NBBC, KNIER, etc: Design method of the study and collect information at site, probably involve local birdwatchers for smple information collection. Research organizations and universities: Design and conduct the study. Analysis of data.	BLA and partners: Produce printed material on intraspecific studies for amateur birders to collect information	Low
Study the carrying capacity of BFS at their sites	Study the special and food requirement of BFS at important breeding, migration and wintering sites to determine the factors on carrying capacity at the sites	All range states and researcher institutions.	Government bodies: Financial and legal support. National research institutions (NBBC, KNIER etc.) Conduct site study and environmental assessment.	All: the results should be used to identify limiting factors and improve site management	High

5. Reduce risk of epidemic disease to the Black-faced Spoonbill populations

The outbreak of botulism in Tainan, late 2002 shows disaster would happen and we should well prepare for it. A well-coordinated emergency response system is highly recommended. This can cover other waterbird species, particularly those species that are also vulnerable due to their high concentration (e.g. cranes)

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establishing a disease alarming coordination system	Establish an efficient system within the range to ensure rapid coordination in case of disease outbreak.	All range states and research institutes	All: To discuss identification of an international information center for coordination and information exchange Regional coordination centers should be established at important sites for BFS.	All to consider how to strengthen links with other BFS sites	High
	Contingency planning for epidemics such as avian influenza	All range states and research institutes	All countries: To draft contingency planning and identify focal point in the country/district.	Same as the above	High
Collecting pathological and biological samples	Standardising sampling collection procedure	KFBG (HK) Animal Health Research Institute, Council of Agriculture (Taiwan) ??? (Japan)	KFBG: making a protocol to standardize blood sampling	KBFG, (Taiwan), (Japan) : information gathering, exchange and regular communication.	Moderate

Rescue training	Training on how to handle sick/injured birds and follow up caring	KFBG (HK) Tainan County Government and WBFT local partners (Taiwan)	KFBG: organizing training course for important wintering sites.		High
	Drafting a manual on bird rescue methods	KFBG (HK) Tainan Government (Taiwan)	KFBG: provide funds for publication organize a workshop to draft the manual	Translation of the manual into other languages.	High

6. Strengthen international coordination:

The existing network should be expanded and strengthened. From the experience of the last action plan (Severinghaus et. al. 1995), the network could take the lead in implementation of the actions.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
International coordination system be established	International coordinator nominated and funds secured	All range countries and relevant organizations	At the workshop in Hong Kong in January 2006. An international coordinator based at the HKBWS was agreed in principle. Details still needed to be discussed. Financial and other support is still needed.	Clearly define the role of the coordinator and the supporting system (Flyway partnership Working Group will be an option. See below)	High
	Strengthen the existing international network Consolidate a strong system of network amongst sites and organizations	JBFSN, BLA and partners, Korea University, KFEM	Local networks and organizations: Improving communication at local and domestic level WBSJ, WBFT, HKBWS, BL in Indochina, KFEM, Korea University etc: Coordinate international and local activities. BLA: Supporting the international communication. And when the international coordinator is confirmed, support the work of the coordinator.	One coordinator in each country/territory. Improve communication and establish a coordination system with organozations in Russia, China mainland and North Korea	High
	Regular international meetings	All range countries and relevant organization	All: Fundraising and organization of meeting	Meeting should have clear objectives and targets to be achieved. Avoid duplication of meetings.	Moderate

Establish of an international homepage	Focus on information sharing, site management and conservation issues.	HKBWS, KFEM, WBSJ, Korea University, WBFT etc.:	All: Discuss and decide the host of the website and how to coordinate information exchange Providing information, website management Get financial support locally for all national and local websites	Establish the international website in different national languages and nominate national web managers.	High
Establish international mailing list	Focus on migration news and more urgent issues such as disease alarm	All organizations involved.	All: Nomination of an international coordinator for message dissemination (can be the same or different person or organization as the i9nternational coordinator mentioned above). The information sent should be translated and send to a wider recipient in each country/territory.		High
Participation in the Eastern Asia Flyway Partnership network	Participate in the Flyway Partnership to be formally started in late 2007	MEN Russia, SFA, MOEK, MOEJ, MONRE, BLA and partners	Government agencies: Support the establishment of a BFS Working Group in the Flyway Partnership. BLA and partners: Assist in the establishment of the Working Group and drafting plans and terms of references	Working group established for the BFS. The existing network should play an important role in the working group for technical advice.	High

7. Strengthen local coordination:

As the biggest threat to Black-faced Spoonbill is site degradation and disturbance in many countries, cooperation must be sought from the local communities. Tainan has provided an excellent example of how local communities could be won to support conservation, and the experiment at the Red River Delta in Vietnam will be very good reference on communities work to other countries.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establish BFS task force in each range state and region	Organizing national or local meeting to discuss formation of the local task force.	All range countries and relevant organization	All: Meeting to discuss the members and role of the task forces. The task force should have representation from government economic policy and planning agency	All: Link the task force to form an important part of the national network that supports the international network proposed in E.	High
Site Support	Using the experience of Red River Delta Site	BLA, JBFSN, HKBWS,	BLA: Fundraising and organizing meeting to	All: Develop plans and	High

Groups formed at some important sites	Supporting Group (and probably Tainan) to form similar local groups at some important sites.	WBFT, Korea University, KFEM, other conservation groups in range states	introduce the Vietnamese experience Other organizations: Consider formation of similar Site Support Groups at some of the most important sites for BFS	activities of the Site Support Groups. Exchange of experience and information.	
Involvement of local people in the discussion of the site management	Organize regular meetings with local communities at important sites for explanation of conservation management measures or provide education activities	JBFSN, HKBWS, WBFT, Korea University, KFEM, other conservation groups in range states	All: Organizing meetings and activities. This is best done by Site Support Group if the site has established one.		Moderate

8. Establishment of database

One or more database or libraries on Black-faced Spoonbill or important site information should be established and shared amongst all countries.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Formation of one or more database for data collection	List up data that should be collected, including biometric data, DNA, parasite sample etc. Ensure when a bird is in hand valuable data are collected	KFBG (?)		Establishment of database and dissemination.	Moderate

9. Capacity building

Empowering researchers, site managers and all stakeholders on techniques related to conservation of Black-faced Spoonbill and management of important sites.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority

Compile technical manuals	Compile a technical manual on habitat creation and management in all languages in the flyway.	BLA and partners, WWFHK, other conservation organizations	BLA, WWFHK: Identify funds for the compilation of manual. All: Nomination of editorial team and drafting the manual	All: Distribution of the manual and organizing training course for management staff of important sites	High
	Compile a manual on appropriate practice of ecotourism in different languages.	BLA and partners, WWFHK, other conservation organizations	BLA, WWFHK: Identify funds for the compilation of manual. BLA: Provide information and experience on the ecotourism charter compiled by BLA partners. All: Nomination of editorial team and drafting the manual	All: Distribution of the manual and organizing training course for management staff of important sites and agencies related to ecotourism at important sites.	High
Training courses	Training courses on site management offered to management staff of important sites	Government agencies, BLA and partners, WWFHK, other conservation organizations	Government agencies: Giving financial and legal support BLA, WWFHK and others: Facilitate training courses.	All: Monitor the effectiveness of the training course	High
	Training courses on education offered to management staff of important sites	Government agencies, BLA and partners, WWFHK, other conservation organizations	Government agencies: Giving financial and legal support BLA, WWFHK and others: Facilitate training courses.	All: Monitor the effectiveness of the training course	High
	Training courses on site monitoring and simple research offered to management staff of important sites	Government agencies, BLA and partners, WWFHK, other research organizations	Government agencies: Giving financial and legal support BLA, WWFHK and others: Facilitate training courses.	All: Monitor the effectiveness of the training course	High

Regional/National:

Russia

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Protection of the breeding site	Enforce strict protected to the recently discovered breeding site.	Russian government, researchers, BLA, WWF Russia and RBCU	Government: Establish warden post and regular patrolling the site, especially during breeding seasons to prevent poaching and disturbance	BLA and WWF Russia: Fundraising and assisting management of the protected area. Researchers: Provide scientific data for conservation plan of the site. RBCU: Strengthen international linkage and promote exchange of information and experience amongst range states.	High
Education program in Russia	Promote a high sense of awareness in Russia (especially Primorsky Kray) on the importance of BFS	Russian government, BLA, WWF Russia and RBCU	Government: Giving legal and financial support to the initiative BLA, WWF Russia, RBCU: producing education material and media coverage on the BFS conservation matters	BLA. WWF Russia, RBCU: Design a long term education programme for the BFS of Russia	High
Develop international cooperation project	Exchange of management experience and scientific data with Japan, North Korea, South Korea and China	Russian government, research institutes, WWF Russia and RBCU	Russian government: Formalizing cooperation agreements. WWF Russia, RBCU: Assist in coordination on Flyway issues Research institutes: Conducting joint projects with counterparts in China, North Korea, South Korea and Japan	All: Develop joint projects for conservation of the breeding site in Russia.	High

China

Mainland China

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Species and Site Protection	The conservation status of Black-faced Spoonbill should be raised to the First Category	SFA	List the BFS to the first category at the next revision of the national protection list.		High
	Strengthen protection of the breeding ground	SFA and Forest Department of Liaoning	Existing breeding sites should be strictly protected. Poaching, egg-collecting and disturbing of breeding birds should be strictly forbidden		High
	Establish protected area at the Zhanghe coast as feeding and roosting sites of the breeding population	SFA and Forest Department of Liaoning	Survey to investigate the area needed to be included inside the protected area. Discuss with local stakeholders and pass the legislation	Working with local stakeholders on drafting a management plan and define the role of each party involved in the management and activity of the site	High
	Establishment of conservation station at the Min Jiang Estuary, Fujian.	Forest Department of Fujian Province (FJFD), FJBWS	Application for the establishment of conservation station, fundraising, construction, enrollment of volunteers	Fundraising to sustain the conservation station.	High
	Upgrade the protected area at Houshui Wan, Hainan and Gongping Dahu, Guangdong to become a national nature reserves	SFA and Forest Departments in Guangdong and Hainan.	Study on the boundary of the protected area and discuss with local stakeholders on upgrading the status of the nature reserves		High
	Produce a manual on site management at important BFS sites.	SFA, WWF China, BLA	Translation and editing the manual produced internationally		High
Education and promotion	Produce printed material to promote BFS conservation and raise public awareness on BFS, particularly on finding unknown sites of BFS.	SFA, NBBC, Birdwatching societies in China, BLA, HKBWS, WWF China	Producing posters, post cars, leaflets, education packs etc. on BFS mainly targeted at schools.		High
	Translate relevant material on BFS into Chinese	??			Moderate

	Organizing events to promote BFS and sites	Local Forestry Departments, birdwatching societies in China	Organizing photographic exhibitions on BFS at appropriate time of the year (depending on whether BFS is breeding, migrating or wintering)	Local government and birdwatching organizations: Could organize regional or national meetings and open symposia on conservation of BFS to be held in conjunction with the exhibition	Moderate
	Organizing promotion activities on BFS at the Min Jiang Estuary.	BLA, HKBWS, WWFHK , Forestry Department in Fujian, FJBWS	BLA, HKBWS, WWFHK: Provide funding and technical assistance Forestry Department in Fujian, FJBWS: Coordinating the activity, assisting participants. Encourage good practice of land use that is compatible to BFS conservation.	All: Invite all local stakeholders to plan for good land-use at the Min Jiang Estuary.	High
Detailed survey of Black-faced Spoonbills	Organizing researchers and birdwatchers to survey potential migratory stop-over and wintering sites (especially estuarine wetlands) to identify important sites to BFS	FJBWS, NBBC, SFA, ZJBWS, XMBWS, HKBWS, WWFHK, COS, BLA	SFA: Financing and giving legal support BLA, HKBWS, WWFHK: Financing and international coordination NBBC, COS, HKBWS: Coordination of survey. Birdwatching societies, local forestry bureaus and NBBC: Training course for members, site survey, and data analysis. FJBWS, XMBWS: Arranging the above activities in Fujian Province ZJBWS : Arranging the above activities in Zhejiang Province	All: Discussion on publishing reports on the status of BFS in the provinces, fundraising for follow-up conservation activities SFA: Considering designation of important sites as protected areas Birdwatching societies, local forestry bureaus: Monitoring of important sites.	High

	Survey for the main staging site of non-breeding birds when positive information received. The most likely areas as staging site of non-breeding BFS is northern Jiangsu Province and Northeast China.	NBBC, SFA, COS, BLA, birdwatching societies in northern China	SFA: Financing and giving legal support BLA, HKBWS: Financing and international coordination NBBC, COS, HKBWS: Coordination of survey. Birdwatching societies, local forestry bureaus and NBBC: Training course for members, site survey, and data analysis.	All: Discussion on publishing reports on the status of Black-faced Spoonbills in the provinces, fundraising for follow-up conservation activities SFA: Considering designation of important sites as protected areas Birdwatching societies, local forestry bureaus: Monitoring of important sites.	High
Research on the BFS	Find out background information and basic biology and ecology of food species of the BFS in the breeding ground of China	SFA China, NBBC	SFA China: funding and legal support NBBC: facilitating the study with local forestry bureaus and academic institutions	NBBC: recommendation of site management to provide optimal feeding ground for BFS BirdLife Asia: Coordination discussion and dissemination of result.	High
	Find out background information and basic biology and ecology of food species of the BFS in the wintering grounds of China mainland	SFA China, NBBC	SFA China: funding and legal support NBBC: facilitating the study with local forestry bureaus and academic institutions	NBBC: recommendation of site management to provide optimal feeding ground for BFS BirdLife Asia: Coordination discussion and dissemination of result.	High
Involving local community in BFS conservation	Introducing the idea of Site Support Group of IBA to sites in China	BLA, HKBWS	BLA: Organize workshops and provide the Vietnamese experience of Site Support Group at an Important Bird Area HKBWS: Facilitation workshops in China	Follow up with all level of government and organizations to discuss a plan of involving local communities in conservation of BFS	High
	Establishing a good cooperative relationship between local governments and birdwatching societies	Fujian Bird watching Society	Provide relevant information and material, information exchange, organizing site study tours	Inviting relevant government departments to protect Black-faced Spoonbills	High
	Organizing regular survey of Black-faced Spoonbills, setting rules for volunteers, meetings for information and idea exchanges	Fujian Bird Watching Society	Fundraising, training of volunteers, formalize rules on behavior of conservation volunteers.	Formation of a volunteer club on conservation of Black-faced Spoonbills	high

Capacity building	Training course provided to nature reserve officers and relevant conservation organizations	BLA, WWFHK	Training in managing education programme, including interpretation at site, monitoring and site management		High
	Training of voluntary rangers at BFS sites at the Min Jiang Estuary	Fujian Bird Watching Society	Fundraising, enrollment of volunteers, training of voluntary rangers	Coordination and information exchange with voluntary rangers	Moderate

Taiwan

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
management of BFS protected area	Establish executive committee at each protected area	local government, conservation division of central government, local conservation groups	local government: budget planning and providing conservation division of central government: provide funding and coordination. Local conservation groups: provide local assistance, training of volunteer for required manpower.		High
	Establish ranger systems for the protected area (paid staff, part time, or volunteer based site supporting group)	local government, local conservation groups national and international NGO	Government: evaluate the most appropriate system for each site and authorization to civil organization. International NGO: provide training Local NGO: provide local assistance		High
	Monitoring the habitat quality	local government	local government: routinely monitoring the change of habitat		Moderate

Hong Kong

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Study of BFS's feeding behaviour	a. find out background information and basic biology and ecology of food species of the BFS in Hong Kong	WWFHK, AFCD, HKU	AFCD : finding funding source WWF, HKU : facilitating the study	HKU: make programme for a Ph.D study	Moderate

Macao

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Study the BFS in Macao	Study the habitat needs of the wintering population in Macao	Macao Government and NGOS	Design study programme. Probably with the assistance of BFS experts from mainland, Taiwan or Hong Kong		High
Protection of the wintering site in Macao	Designation protected areas	Macao Government	Designation of protected area based on scientific data		High
	Management plan drafted for the protected area	Macao Government, WWF HK, BLA and partners	Government: Providing legal and financial supports WWF HK, BLA and partners: Providing technical support in drafting management plans		High
	Education programme to promote awareness in Macao.	Macao Government and NGO	Government and NGOs: Organizing education and promotion activities		High

South Korea

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Conservation of important sites	Concerning the conservation of Ganghwa tidal flats, an important roosting and feeding area of fledged breeding birds				
	Jeju?				
Research	Study of BFS's feeding behaviour: Find out background information and basic biology and ecology of food species of the BFS in South Korea	MOE Korea, KNIER	MOE Korea: funding and legal support KNIER: facilitating the study	KNIER: recommendation of site management to provide optimal feeding ground for BFS	
	Continue color banding of BFS				
Networking in South Korea	Formation of a national network				
	Annual symposium in breeding or wintering sites				

Information and education	Develop a website of BFS				
	Publication of newsletter				
	Develop education material				

Japan

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Alarm system	Establish a system in respond to threats	JBFSN, WBSJ	JBFSN: Identification of threat WBSJ: Response to threats		High

Vietnam

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Improve knowledge of distribution and status of BFS	Additional survey is required to affirm the distribution and status of the Black-faced Spoonbill in Vietnam.	BLA Indochina Programme	The surveys should focus in the Red River Delta, where this species was believed to still occur in number of sites.		High?
Capacity building	for the management boards of Tien Hai Nature Reserve and Xuan Thuy National Park.		Training course organized for these two nature reserves.		

Others

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Safeguard sites in SE	Monitor the BFS population at Banates Islands (the Philippines) for recommendation of site management.	Philippine Government, Haribon Foundation			Moderate

Asia	Conservation and management plan for the Inner Gulf of Thailand	Thai Government, BCST			Moderate
Species protection	BFS to be included in the national conservation list in Cambodia	Cambodian Government, BLA			High
Promotion material on BFS produced for the Philippines. Cambodia and Thailand	Posters and leftlet on BFS produced in national languages	BLA and partners			Moderate

② Long-term objectives (from now to beyond 2012)

International

1. International Cooperation

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Consolidate an international network	Coordinator and working group identified.	All government and NGOs	An international meeting should be held to discuss the formation of the network. It should take an active role in the Flyway Partnership in Eastern Asia	Should discuss how Taiwan BFS conservationists and groups could contribute to the network	High
	International website on BFS in different range state languages established	All government and NGOs	Website managers and host to be identified in range countries and regions.	Ensure a smooth information exchange between countries. Announcement and results of census and activities can be posted on the website	High
	Strengthen relations between different BFS sites	Government agencies, site managers and NGOs	Twining of important sites for exchange of management experience.		Moderate
Joint census on BFS	Annual winter census	HKBWS, all national networks etc	HKBWS: coordination of census and reporting, fundraising Others : participating	Meeting for review of method and data to be held once every several years	High
	Annual breeding census	Russia, North Korea, South Korea, NBBC	All: An international coordinator needed to be identified. All: Exchange of information		High
Regular meeting amongst site managers and	Meetings on updated risk assessment and management recommendation	All government and organizations	Regular international meeting with different focus and targets. Invite new members to the conservation network		Moderate

specialists					
Colour banding coordiantion	Coordination of re-sighting reports	All national and district banding schemes, BLA and partners, KFEM	National banding schemes: Compilation of records. BLA and partners, KFEM: Dissemination of information.	All: Discuss a regional coordination center for dissemination of colour-banding information (at present HKBWS and WBSJ are playing this role)	High

2. Site conservation

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establish additional breeding sites	After studying the requirement of breeding biology of BFS, try to create similar habitat at sites with good legal protection and low human disturbance (western Japan would be ideal) to attract nesting BFS	Government and conservation agencies of Russia, North Korea, South Korea, China and Japan	Research organizations: Summarize the data on favorable breeding habitat of BFS and proposed potential site in the region. Government: Funding and supporting feasibility study of establishing new breeding sites	All: Preliminary projects on attracting breeding BFSs to new breeding sites	High
Site Monitoring Programme at all important sites	Monitor critical environmental factors at different important sites (water quality, food availability, development pressure etc.)	Site managers and local conservation organizations, BLA	Site managers and researchers: Deciding what are the environmental factors needed to be monitored at the site. Interpretation of data collected. Site manager and local organization: Regularly collect data on these factors. BLA: Technical support and international linkage	Monitoring reports should be regularly studied for management recommendations	High
Site Support Group system developed at all important sites	Establish Site Support Groups at important sites to assist conservation and education activities. Site Support Group could help in monitoring of the site.	Site managers and local conservation organizations, BLA	Meeting with all stakeholders to discuss formation of Site Support Groups. Define the role of the Site Support Group.	Assist Site Support Groups to produce annual report. Give them a high sense of belonging to the site	High

3. Evaluation of conservation actions

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Evaluation of this action plan in mid-2010s					Moderate

Regional/National

Russia

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Monitoring of the breeding population					High
International cooperation	Regularly exchange information with countries that have breeding BFS: China, North Korea, South Korea				High

China

Mainland China

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establish new protected areas in from any					

new discoveries					
Maintain traditional use of wetlands at SE coastal China					
Monitoring of sites	a. Assessment on the environment of Black-faced Spoonbill habitats in Fujian	Fujian Bird Watching Society (FJBWS) Fujian Wildlife Monitoring Center (FJWMC), Fujian Forestry Survey and Planning Institute (FJFSPI)	Fundraising, contact relevant research organizations, site survey	Reporting results of the assessment, symposium on the result of assessment, continue raising funds for the study, analysis on the impact of major pollutants to Black-faced Spoonbills	moderate
	b. Keeping vigilance on changes of environmental factors at the sites Fujian, particularly Min Jiang estuary	FJBWS, relevant media in Fujian province	FJBWS – Formation of a special working group on Black-faced Spoonbills, reporting news on Black-faced Spoonbills and their habitats in form of electronic newsletters	Continuation of collecting information on environmental changes.	High
	c. Monitoring program at Black-faced Spoonbill Sites	Forestry Department of Fujian Provimce (FJFD), FJBWS	Collecting samples and laboratory analysis.	Report on how changes in the water environment would affect the survival of Black-faced Spoonbills	Moderate
Research	Satellite tracking of birds at the breeding grounds in China to discover autumn migration route	SFA China, NBBC, YIO, WBSJ, KIER, BirdLife Asia	SFA China : approval and legal support NBBC : facilitating the program YIO, WBSJ KIER: technical supports BirdLife Asia and partners : information coordination and distribution	NBBC, BirdLife Asia and partners: communication with wintering sites identified. Proposal to national governments to designate protected areas.	Moderate

Exchange of information	Organizing international activities during the migratory season of Black-faced Spoonbills	FJBWS, Fujian Wildlife Monitoring Center, Fujian Institute on Forestry Survey and Planning, forestry bureaus at important sites	Fundraising, organizing activities, reporting results	Establishment of a platform of a global monitoring network	High
	Publication of reference book on summary of experience in monitoring of Black-faced Spoonbills	FJBWS	Fundraising, compilation of reference and publication	Promote the conservation of Black-faced Spoonbills	moderate
Regional cooperation	Cooperation between Hong Kong and Shenzhen to control illegal fishing on Deep Bay/Shenzhen Wan tidal flat.				
	Cooperation and coordination between Macao and Zhuhai to maintain sites important to the wintering BFS.				
	Research and conservation organizations in mainland should develop closer links with their counter parts in Taiwan, Hong Kong and Macao				
Promotion and education	Through media report more about conservation of BFS to raise the profile of this species in China.				

Taiwan

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Emergency warning and respond mechanism	Establish an emergency warning and respond system	local government, conservation division of central government, local conservation groups	local government – budget planning and providing conservation division of central government – provide funding and coordination. local conservation groups - provide local assistance, training of volunteer for required manpower.	local government –	High

Training program	Training program. for local volunteer		Government – evaluate the most appropriate system for each site and authorization to civil organization. International NGO – provide training Local NGO – provide local assistance		High
	c. Monitoring the habitat quality	local government	local government – routinely monitoring the change of habitat		Moderate

Hong Kong

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Fish pond management	Purchasing fish pond or suggest more environmentally friendly management methods to provide more feeding grounds for BFS.				

Macao

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Promotion programme on BFS	Promotion activities to boost the image of the importance of BFS to Macao, targeting both government officers and the general public.				

Korea

North and South Korea

Program	Activity	Responsible	Implementation progress	Further specific actions to	Priority

		organization		undertake	
Cooperation project between North and South Korea					

South Korea

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Study the wintering behavior of BFS in Jeju					

Japan

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority

Vietnam

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Management at the Red River Delta	Integrate wetland conservation into aquaculture development in the Red River Delta e.g. expand the new model of "ecological ponds" for shrimp hatching				

	as piloting in Tien Hai Nature Reserve; incorporate the conservation needs into pond contracts as the current system in Thai Thuy District				
Local community network	Strengthen the existing community-based groups and established the new ones to complete a network of community support for the key sites for Black-faced Spoonbill				
Site protection and management	Designate the remained key sites for Black-faced Spoonbill as Ramsar Site				
	Strengthen protected area management at sites regularly supporting significant numbers of Black-face Spoonbill.				
	Confer appropriate protected area status on key wetland sites in the Red River Delta.				
Promotion and awareness	For the local stakeholders in the key sites.		. Using different means of propaganda such as: social events, posters, leaflets, and mass media etc		
	For the key planners and decision makers at district, provincial and central levels on the importance of BFS				

V. Appendices

① Biology of Black-faced Spoonbill

Breeding biology:

At the sites in South Korea, Black-faced Spoonbills are observed to nest on the ground or on short bushes, in North Korea and China, Black-faced Spoonbills build their nests on stiff cliff. The difference of nesting behaviour in South Korea is probably due to the strictly prohibited entry into the Demilitarized Zone therefore no disturbance to nesting birds. Birds nesting in North Korea and China are probably forced to nest at the higher cliffs.

In South Korea, the nests are usually round and average 42.3 cm in diameter (check with Lee). Nesting material is usually made of *Chenopodium album* and *Artemisia capillalis*. Breeding period from April to June and incubation period from May to July. Clutch is usually three eggs but clutch with four eggs has also been recorded. Breeding success is observed to be 55.2% in 2004 with slightly more than half of the nestlings successfully raised and fledged.

Most of the birds return to the same breeding sites but build new nests. Some birds are found to change their mate in different years. There was one record of hybridization with Eurasian Spoonbill (check with Lee Ki-sup)

In China, a few pairs were found nesting on islands offshore of Liaoning Province. They were observed to make a 3-4 hour single trip to the nearest tidal flat during the breeding season.

Post-breeding: Ganghwa Island is the most important staging ground of Black-faced Spoonbill after breeding. About 100-120 birds (adult and young?) stayed at the tidal flat of southern Kanghwa form xx to xx (check with Lee Ki-sup)

Breeding birds in China were observed to departed the breeding islands after August (as soon as the chicks fledged???) and stayed at the Zhuanghe coast until October.

Wintering biology: In Tainan they are found mainly roosting in a big reclaimed lagoon during daytime and feed in the fish ponds nears mainly at night. They can be found feeding at daytime if disturbance is low. They can be found foraging as far as twenty km from their roost (check with Fang and Liu Liang-li). In Hong Kong and Vietnam they are found roosting in tidal ponds and feed on tidal flats or drained fish ponds. They are opportunistic feeders and will take big fish, although the main diet seems to be smaller aquatic animals but not benthos. The wintering flock is found form October to April but a

few immature bird may stay in the wintering grounds in summer. However, the main site for non-breeding immature birds in summer has not yet been found.

② Action Plan drafted in 1995 and its implementation

It has been more than 10 years since the publication of the 1995 Action Plan. The following is an attempt to evaluate the effectiveness of implementation of the 1995 Action Plan for the reference of drafting the new plan. For the sake of simplicity, rather subjective ranks (A-D) are given to each recommended action as printed on the 1995 Action Plan with short explanation:

A – Action proposed has almost fully implemented (over 80%)

B – Action proposed has adequately implemented (30-80%)

C – Action proposed has started but still a lot needed to be done (less than 30%)

D – No action taken since 1995

Recommendations form the 1995 Action Plan:

1. Considered to be urgent:

1-A That the Black-faced Spoonbill and sites that it uses be protected

B / C Biggest achievement is the protection of sites in Tainan. However, many important sites all over its range are still not yet officially protected.

1-B That studies be conducted in range states to determine the following

a) the availability of and threats to habitat used for breeding, migration and wintering. Known sites should be surveyed first, then potential sites second. Additional breeding sites on the Korean Peninsula should be located and protected.

B. Thorough studies at breeding sites by Korean researchers in South Korea. Some study at breeding sites in North Korea and Liaoning of China. At main wintering grounds, good studies on habitat use and feeding behavior had been conducted in Tainan and Hong Kong. A well-covered wintering ground survey in China mainland was conducted by the National Bird Banding Center of China that revealed major wintering grounds on Hainan.

b) The size of the total world population of the species, including the sizes of sub-populations which use each site, and

A. The annual census has been coordinated by Hong Kong conservationists since the mid-1990s. It covers almost all known sites and is probably one of the best census projects for any bird species.

c) The migration routes of this species

A. Satellite tracking revealed major migratory routes of wintering birds in Taiwan, Hong Kong and Okinawa. Color-banded birds from South Korea provide useful re-sighting records of birds from the breeding ground of the DMZ (Demilitarized Zone of the Korean Peninsula).

1-C That country and local task forces be established through national and local bird clubs, research institutions and/or management agencies. Each local task force should set action priorities for its respective country and identify limiting factors to the conservation of this species.

B. An informal network initiated by BirdLife has been active since 1996. There are also local networks on Black-faced Spoonbills in South Korea, Japan, Taiwan and Hong Kong.

1-D That an international "Black-faced Spoonbill Center" be established or a liaison officer be appointed immediately under an existing Asian organization to support organizations and people in each of the range states working toward the conservation of this species by assuming responsibility for:

B. The center or liaison officer has never been materialized but the above cited informal network has taken the initiative of the responsibilities listed below.

a) disseminating information on the species to those involved in conservation of the species,

A. Information disseminating has been done very well through various mailing lists and publications since 1996

b) facilitating communication among researchers and conservationists involved with the species,

B. There have been many international and national workshops and meetings since 1996, particularly those held in South Korea, Japan and Taiwan, they provided excellent chances in communication and coordination amongst researchers and conservationists.

c) coordinating training of personnel working in range countries,

B. Training courses on Black-faced Spoonbill related survey have been conducted in China mainland by the Hong Kong Bird Watching Society and WWF Hong Kong; and in Japan by BirdLife International.

d) locating funding for Black-faced Spoonbill conservation and related research,

B. Project funds have been secured in South Korea, Japan, Taiwan and Hong Kong. China mainland had funded the coastal survey for wintering sites.

e) conducting an exhaustive literature search,

A. Extensive literature search done during the compilation of Threatened Birds of Asia: The BirdLife International Red Data Book.

f) collecting all information on captive birds by contacting zoos and animal keepers,

A. Most of captive birds are kept at Tama Zoo, Japan. Wild Bird Society of Japan has good links to the zoo.

g) tabulating all information on museum specimens,

A. Extensive literature search done during the compilation of Threatened Birds of Asia: The BirdLife International Red Data Book.

h) establishing a Black-faced Spoonbill newsletter and network, and

B. Neither had been formally published nor established to cover all the range but there has been very active communication among people and organizations concerned. Websites on Black-faced Spoonbills also hosted in South Korea, Taiwan and Hong Kong.

i) coordinating a review on a regular basis (every one to two years) of this and future action plans, and revising and rewriting them to reflect the most current needs and knowledge/understanding of the species.

A. BirdLife partners in Asia, and Korean Federation of Environmental Movement (KFEM) in South Korea organize regular meetings (almost annually since 1996) to review conservation needs of Black-faced Spoonbills.

1-E That national and international campaigns be initiated to promote the public education and awareness of the conservation needs of the species and its habitats. Promotional and educational material for the conservation of Black-faced Spoonbills (e.g. TV documentaries, booklets and flyers, posters, T-shirts, calendars, logos etc.) should be developed in national range-state languages. Conservation educational programs targeted at children should be developed.

A. Throughout the range countries the Black-faced Spoonbill has become one of the best-known birds for conservation.

1-F That there be an increase in communication and cooperation among those working on Black-faced Spoonbills, wading birds and wetlands. Furthermore, the International Crane Foundation, the Asian Wetland Bureau and other international waterbird or wetland-related NGO's operating in Asia should be contacted to remain alert for possible breeding and wintering sites of Black-faced Spoonbills in Asia.

A. There has been very good coordination on the activities from BirdLife partners. International organizations are all well-informed on the status of the Black-faced Spoonbill,

1-G That funding sources, both in-country and international, be sought for research programs, including the training of research and field personnel. International cooperation and coordination of training programs should be encouraged.

B. Funds have been raised for research projects in Japan, China mainland, Taiwan, Hong Kong and South Korea

Summary: Apart from some sites are still under threat (notably sites in Macao and southern coast of China mainland), and that a formal conservation center has not been established, most of the recommendations regarded to be as highest priority have been satisfactory implemented.

2. Considered to be of high priority:

2-A That international treaties and conventions reflect the endangered status of the Black-faced Spoonbill with appropriate protection, e.g. the Black-faced Spoonbill be included in Appendix I of the Bonn Convention[7].;

A. In 2002, BirdLife International assisted the Government of the Philippines to list this species to the appendix of the Convention of Migratory Species.

and, that international treaties among range states protect the Black-faced Spoonbill along its migratory flyways.

A. No formal international treaty on the Black-faced spoonbill but it is a species of high priority to the Asia-Pacific Migratory Waterbird Strategy (1996-2000, and 2001-2005)

2-B That joint research and training sessions be set up among scientists and field personnel working in the range states.

B. Good international cooperation on the Black-faced Spoonbill studies, such as joint research on satellite tracking between Japan and Taiwan, Japan and Hong Kong, joint breeding ground study between Japan and South Korea, joint wintering ground survey between Japan and China mainland, joint wintering census between Taiwan and Vietnam etc.

2-C That management plans for critical habitats should be developed by each range country reflecting the situations faced by the Black-faced Spoonbill in that country.

C. Not all important sites have developed management plans.

2-D That banding and radio telemetry programs and satellite tracking schemes be established ONLY after appropriate protocols have been established and personnel have been properly trained, and that such programs are coordinated internationally.

A. Banding is well-coordinated in the region. Satellite tracking from wintering birds of Taiwan, Hong Kong and Okinawa has involved local government agencies, conservation organizations and banding schemes.

[7] More officially known as the Convention of Migratory Species (CMS)

2-E That in situ conservation efforts described above be given priority for funding and manpower and ex situ conservation efforts NOT be considered at this stage.

A Apparently no wild birds (except those needed to be rehabilitated) have been taken into captivity in the last 10 years.

Summary: For actions considered as of high priority, most have been successfully implemented. The main weakness is again site conservation and management.

3. Considered to be of medium priority:

3-A That reports and workshops on the conservation and scientific research of Black-faced Spoonbills be included as parts of Asian conservation ad ornithological meetings.

B. Many international and national workshops held between 1996 and 2005. Black-faced Spoonbill issues have always been an important species conservation issue to BirdLife International, and it is also discussed at the International Ornithological Congress.

3-B That field data on this species be published in as timely a manner as possible to stimulate further studies and give feedback to all observers.

B. Field data on migration and other studies are published regularly.

3-C That each national task force evaluate its own country's relevant legislation (e.g. environmental impact legislation, pollution control legislation an zoning and land use legislation) to determine if it adequately supports wetland conservation. Each country's task force should lobby for effective enforcement of existing laws which support wetland conservation.

C. Not adequate as national task forces has been established. There are networks on Black-faced Spoonbill in Japan, South Korea, Taiwan and Hong Kong but their roles to lobby government agencies have to be strengthened.

Country-specific recommendations from the 1995 Action Plan that have achieved satisfactory progress from 1995 to 2005:

- Research on breeding biology of Black-faced Spoonbill in North Korea.
- Research on breeding biology of Black-faced Spoonbills in South Korea.
- South Korea should become a party to the Ramsar Convention.

- Nature reserve should be established on the tidal mudflats on Kyushu Island, especially those of Hakata Bay and Ariake Bay, for the conservation of Black-faced Spoonbills in Japan.
- Surveys should be conducted for Black-faced Spoonbill breeding sites in China (Mainland).
- Survey should be conducted to determine migratory routes and possible stopover sites along the eastern and southeastern coasts of China (Mainland).
- Ground surveys should be conducted to determine whether wintering flocks exist in potential areas on the coast of eastern and southern China.
- A nature reserve, including nearby foraging and roosting sites, should be established at the Tsengwen River estuary, Taiwan.
- Quantitative research on the wintering needs of the Black-faced Spoonbill should be conducted in Taiwan.
  - The development of land adjacent to the Inner Deep Bay and Mai Po marshes in Hong Kong should be made compatible with the conservation of the wetland system; fish ponds around the Inner Deep Bay area should be conserved as buffer zones and reclamation of these ponds should be prohibited.
  - The Inner Deep bay tidal mudflats should be incorporated into the Mai Po Marshes Nature Reserve , and it should be listed as a Ramsar Site as soon as possible (Hong Kong).
  - Fishery practices compatible with conservation of Black-faced Spoonbills should be encouraged. Government programs for compensation for losses to fisheries from conservation practices should be considered (Hong Kong)
  - Detailed studies of the wintering ecology of Black-faced spoonbills should be conducted in view of the rapid loss of fish ponds in the vicinity of Mai Po (Hong Kong).
  - Surveys should be conducted in northern Luzon, the Philippines, for possible wintering sites of Black-faced Spoonbills.

Conclusion:

The 1995 Action Plan is the first international action plan on Black-faced Spoonbills. With support of almost all government agencies and conservation organizations throughout the range of Black-faced Spoonbills, it has achieved a great success. In fact it could be regarded as one of the most successful action plans on threatened birds ever implemented in Asia. However, over the last 10 years new threats have arisen, amongst these the concentrating wintering population, higher risk in disease and poisoning, and the lack of protection and good management of many important sites are probably the main challenge to the conservation of Black-faced Spoonbills in the next 10 years.

③ Overview of key sites

Definition of key sites:

1. Known breeding grounds

2. Migration or wintering grounds regularly hold (or supposed to hold) more than 15 birds (very approximately 1% of the global population).

Russian Federation:

Breeding ground undisclosed before better protection at site ensured. There is a real threat of disturbance from cameramen and even poachers if the locality of the site is released.

Japan

Fukuoka Prefecture: Imazu Tidal Flat[8]

Location: 33deg35'N 130deg14'E.
Area: 80 ha
Simple description of the site: Tidal flat at the western side of Hakata Bay. Surrounded by farmland. Within the vicinity of the Artificial Island of Hakata Bay, Wajiro Tidal Flat and Tataro River. Substrate muddy and sandy. Black-faced Spoonbills roost at a small island in the Zuibaiji River.
Wetland type: Estuarine tidal flat
Land ownership and land use: No information
Contacts of management authority/authorities: No information
Threats: River training, sedimentation and turbidity due to construction because of development of the nearby area.
Conservation measures taken: Not protected.
Contacts of local researcher/conservation organizations: Fukuoka Chapter of WBSJ

Fukuoka Prefecture: Wajiro Tidal Flat

Location: 33deg41'N 130deg25'E.
Area: 80 ha (?)
Simple description of the site: At the eastern side of Hakata Bay. Heavily built up but some tidal flats and reedbed remains. An artificial island was built by reclamation since 19xx. At the time of drafting this action plan (2006-2007) a temporary wetland site exists on the Artificial Island where Black-faced Spoonbill used as roosting site. It is an important stop-over of migrating Black-faced Spoonbill in the southward migration.
Wetland type: Estuarine tidal flat, artificial freshwater pond (on the island)
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Urban development
Conservation measures taken: Protected area (254 ha) established in 200x?
Contacts of local researcher/conservation organizations: Save Wajiro Association, Fukuoka Chapter of WBSJ?

Nagasaki Prefecture: Isahaya

Location: 32deg50-53'N 130deg2-12'E. Prefecture

[8] 'Higata' in Japanese

Area:
Simple description of the site: Used to be the biggest tidal flat in Japan but a seawall was built in 1990s has blocked waterflow and the tidal flat has dried up. Now only very little area remained as important site for Black-faced Spoonbills (Should we included this site?)
Wetland type: used to be a costal tidal flat but now mostly dried up
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Construction and loss of habitat
Conservation measures taken:
Contacts of local researcher/conservation organizations: Nagasaki Chapter of WBSJ?

Kumamoto Prefecture: Kumamoto New Port

Location: 32deg42'N 130deg36'E.
Area: about 40 ha
Simple description of the site: A river mouth with tidal flat as feeding ground of Black-faced spoonbills, which roost in the reedbed of a reclaimed land. Summer records of Black-faced Spoonbills in 2003 and 2004.
Wetland type: Estuarine tidal flat
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Reclamation and hunting activities (for other gamebirds)
Conservation measures taken: No yet protected but local conservation groups have appealed to the local and central government to protect the wintering ground of Black-faced Spoonbills
Contacts of local researcher/conservation organizations: Kumamoto Chapter of WBSJ?

Kumamoto Prefecture: Hikawa Estuary

Location: 32deg36'N 130deg37'E.
Area: about 70 ha
Simple description of the site: Black-faced Spoonbills roost on the island of the Hikawa River. From here they fly daily to nearby rivers for food.
Wetland type: Estuarine tidal flat, riparian wetland
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Construction of bridge for the Shinkansen of Kyushu (still valid?)
Conservation measures taken: Not yet protected
Contacts of local researcher/conservation organizations: Kumamoto Chapter of WBSJ?

Miyazaki Prefecture: Hitotsuse-gawa Estuary,

Location: 32deg02'N 131deg29'E.
Area: ? ha
Simple description of the site: Sandy island about 500 meters from (upstream of??) the river mouth with drier parts converted to farmland. Artificial pond (sometimes used for eel cultivation) by the river mouth used by Black-faced Spoonbill as roosting area and feeding ground. A fishing port at the northern side of the river mouth.
Wetland type: River mouth (sandy) and artificial ponds
Land ownership and land use:
Contacts of management authority/authorities: State owned ?
Threats: Disturbance from fisheries and leisure makers.
Conservation measures taken: Not yet protected
Contacts of local researcher/conservation organizations:

Kagoshima Prefecture: Beppu Estuary,

Location: 31deg43'N 130deg38'E.
Area: ? ha
Simple description of the site: Sandy island at the river mouth with bamboo groove that sometimes serve as roosting ground of Black-faced Spoonbills(?). Black-faced Spoonbills roost and feed at artificial ponds about 1 km from here.
Wetland type: River mouth (sandy) and artificial ponds
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Reclamation of ponds and urban development. Fisheries and human disturbance.
Conservation measures taken: Not yet protected
Contacts of local researcher/conservation organizations: Kagoshima Chapter of WBSJ?

Kagoshima Prefecture: Manose Estuary,

Location: 31deg26'N 130deg18'E.
Area: About 50 ha
Simple description of the site: Black-faced Spoonbills are found from the river mouth to about 2 km upstream (?). They roost at about 1 km from the river mouth and feed on the tidal flat exposed during low tide.
Wetland type: River mouth (sandy) and artificial ponds
Land ownership and land use:
Contacts of management authority/authorities:
Threats: River training. Fishery and human disturbance
Conservation measures taken: Not yet protected?
Contacts of local researcher/conservation organizations: Kagoshima Chapter of WBSJ?

Okinawa Prefecture: Southern Okinawa Island, (Should the name be changed to Kushi tidal flat and Yone Pond? Is Manko included?)

Location: 26deg10'N 127deg39'E.
Area: About ? ha
Simple description of the site: Kushi has mangroves and reedbed. Yone Pond has some reed in the pond. These are the roosting areas of Black-faced Spoonbills which will feed at Manko and Oomine (?) coast. Manko is surrounded by build-up area. Oomine is the only natural coast remained at the site (Is the area in four pieces?).
Wetland type: Estuarine tidal flat and artificial ponds
Land ownership and land use:
Contacts of management authority/authorities:
Threats: Urbanization and construction. Oomine is under the potential threat of airport expansion.
Conservation measures taken: Manko was designated as a Ramsar Site in 1999. (National Park?) A wetland center established at Manko.
Contacts of local researcher/conservation organizations: Wild Bird Society of Okinawa

North Korea

North Pyongan Province: Daegamdo, Sogamdo and Sonchonnap-do

Location: 39deg25' – 39deg42'N 124deg24'-124deg39'E. Jongju County of North Pyongan Province
Area: Daegando 11.5 ha., Sogamdo 6 ha.
Simple description of the site: Islands in the Hamsong-ryoldo. Intertidal land exposed and it provides good feeding ground of Black-faced Spoonbills.
Wetland type: Coastal islands
Land ownership and land use: State owned. Only a lighthouse is built on Daegamdo.
Contacts of management authority/authorities: No information

Threats: No information
Conservation measures taken: Designated as Sea Bird Breeding Protected Area in 1981.
Contacts of local researcher/conservation organizations:

South Pyongan Province: Dokdo

Location: 38deg49'N 125deg08'E, Onchon County of South Pyongan Province
Area: 18 ha
Simple description of the site: Island with a slack slant at the south side and cliff facing the west, north and east. Black-faced Spoonbills nest at the top of the cliff.
Wetland type: Coastal islands
Land ownership and land use: State owned
Contacts of management authority/authorities: No information
Threats: No information
Conservation measures taken: Designed as a Seabird Protected Area and Natural Monument Number 37 in 1982.
Contacts of local researcher/conservation organizations:

South Korea

South Korea: DMZ islands

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site:
Wetland type: freshwater/brackish/saline; permanent /seasonal; natural/artificial (with percentage); principal vegetation (% coverage)
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Jeju Island: wintering ground at eastern Jeju

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site:
Wetland type:
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

China

Mainland:

Liaoning Province: Xinrentuo

Location: 39deg31'N 123deg02'E, Zhuanghe City, Liaoning Province
Area: 100 ha (or 300 ha??)
Simple description of the site: A rocky island with some grass and bush. Black-faced Spoonbills nest on the highest point of the cliff.

Wetland type: Coastal Island
Land ownership and land use: State owned. An uninhabited island.
Contacts of management authority/authorities: Forest Department of Liaoning Province ?
Threats: Egg collection from fishermen.
Conservation measures taken: In 2003, a restricted zone of water within 30 meters from the Island of Xingrentuo was declared by the Government of Zhuanghe City, Liaoning. A warden post at about 800 meters from the island was established with two 24-hour guards to prevent illegal landing on the island. The municipal protected area Shichengxiang Nature Reserve (13,950 ha including Xingrentuo and adjacent waters) was established by Dalian City in 2005.
Contacts of local researcher/conservation organizations: No information

Shandong Province: Yellow River Delta (Huanghe Sanjiaozhou) Nature Reserve

Location: 37deg35'-38deg12'N 118deg'33-119deg20'E, Dongying City of Shandong Province
Area: 153,000ha
Simple description of the site: The nature reserve is located at the estuary of the Yellow River (into the Gulf of Bohai). It is an alluvial coastal wetland consists of two parts: One along the main channel of the Yellow River and a smaller branch the flows and empties into the Gulf of Bohai northward. Most of the reserve is covered with reeds and small ponds. The nature reserve sits on the third biggest oil field in China.
Wetland type: Estuarine tidal flat
Land ownership and land use: State owned.
Contacts of management authority/authorities: Administration Bureau, Shandong Huanghe Sanjiaozhou Nature Reserve. Number 64 Caozhou Road, Dong Cheng, Dongyong City, Shandong Province, China. Tel: +86-546-8306700. Fax: +86-546-8339581
Threats: Wetland of the Yellow River Delta is vulnerable to the changes in amount of water from the river. In recent years less water inflow has resulted in changes of wetland pattern at the delta. Suitable habitat is also fragmented. There is some disturbance from fishermen and shellfish collectors. Oil pollution is a potential threat to the whole estuarine ecosystem.
Conservation measures taken: Nature Reserve established in 1990
Contacts of local researcher/conservation organizations: Dongying Birdwatching Society. Tel: 86-546-8306700

Jiangsu Province: Yancheng Nature Reserve

Location: 33deg35'N 120deg'30E, Counties of Dafeng, Binhai, Dongtai and Sheyang, Jiangsu Province
Area: 453,300 ha
Simple description of the site: A coastal wetland complex of the Yellow Sea: Permanent, fresh to brackish ponds and marshes, reedbeds, salt marshes and wide intertidal mudflat. The nature reserve is a long (about 300km) and narrow strip of land along the coast, with farmland in the inland side and tidal flat in seaside.
Wetland type: Estuarine tidal flat, artificial ponds
Land ownership and land use: State owned. Agriculture and aquaculture are main use of land at the buffer zone of the nature reserve.
Contacts of management authority/authorities: Administration Office, Yancheng National Nature Reserve, Xinyanggang, Sheyang County, Yancheng City, Jiangsu Province, China 224333. Tel: +86-515-2640806
Threats: Encroachment of wetland for aquaculture. Poisoning of waterbird has been regularly reported.
Conservation measures taken: Nature Reserve established in 1983
Contacts of local researcher/conservation organizations: No information

Shanghai City: Chongming Dongtan (East Coast)

Location: 121deg50"-122deg05'E 31deg25'-31deg38'N. Chongming County, Shanghai City.
Area: 24,155 ha
Simple description of the site: Coastal wetland at the estuary of the Yangtze. With wide tidal flat and coastal salt marsh and reedbed. Wetland still growing eastwards as sediments brought down from the Yangtze but more landward site is converting into farmland or fish ponds.
Wetland type: Estuarine tidal flat, artificial ponds.
Land ownership and land use: State owned. Shellfish collection on the tidal flat by local communities. Agricultural land at landward side of the reserve. Until recently wetland is still being encroached into farmland.
Contacts of management authority: Chongming Nature Reserve, Dongwang Dadao, Chongming, Shanghai, China 202183. Tel: +86-21-59472291. Fax: +86-21-59472291

Threats: Urban development and increasing tourist disturbance. A tunnel connecting Shanghai will be finished by 20xx. It is expected to bring more leisure seekers from Shanghai to eastern Chongming.
Conservation measures taken: Nature Reserve established in 1998, with good research and training facilities.
Contacts of local researcher/conservation organizations: Dr. Ma Zhijun, School of Life Sciences, Fudan University Shanghai, China 200433; Shanghai Bird Watching Society (contact address?)

Zhejiang Province: Wenzhou Bay,

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site: Importance reveled by satellite tracking project in 1998. Should have flocks of about 10 birds migrate through regularly
Wetland type:
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Zhejiang Province: Hangzhou Bay

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site: From recent observations, this should be an important migratory stop-over site
Wetland type:
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Fujian Province: Xinghua Bay

Location: 25deg33'N 119deg37'E, Between Fuqing City and Putian City of Fujian Province.
Area: One suggestion is about 1,400 ha, but difficult to estimate.
Simple description of the site: Several farms at the northern side ("top") of Xinghua Bay are main areas of Black-faced Spoonbill distribution, particularly at Jiangjing Farm because it has some big aquaculture ponds (82 Black-faced spoonbilled were recorded at Jiangjing Farm on 8 December 2005). The area is rather open farmland area with sparse trees and .
Wetland type: Estuarine tidal flat and artificial ponds
Land ownership and land use: Tidal Flat is state owned. The farms belong to the local community. The main economic activities are farming and fish farming.
Contacts of management authority/authorities: Forest departments of Fuqing City and Putian City.
Threats: Human activities and disturbance. Encroachment of tidal flat. Human disturbance. Drainage of fish ponds in winter reduces food supply to Black-faced spoonbills
Conservation measures taken: Not protected
Contacts of local researcher/conservation organizations: Fujian Wildlife and Wetland Monitoring Center.

Fujian Province: Funing Bay (between Hougang Village and Gulingxia Village)

Location: 26deg52'N 120deg07'E, Xiapu County of Fujian Province.
Area: About 400 ha
Simple description of the site: Hougang Wetlands at Xiapu County. A natural coastal wetland with wide tidal mudflats. Black-faced Spoonbills often seen foraging in shallow channels at low tides. Population rather stable (10-15 birds in winter)
Wetland type: Estuarine tidal flat

Land ownership and land use: State owned. Local people have fishing activities on the tidal flat.
Contacts of management authority/authorities: Forest Department of Xiapu County
Threats: Fish farming and economic development. Disturbance of fishing activities.
Conservation measures taken: A small protected area has been established by the Xiapu County in 1997.
Contacts of local researcher/conservation organizations: Fujian Wildlife and Wetland Monitoring Center.

Fujian Province: Min Jiang Estuary

Location: 26deg03'N 119deg37'E, Changle City of Fujian Province.
Area: About 2.921 ha
Simple description of the site: Black-faced Spoonbills are mostly found at a five sq km wetland (mudflat, sandbank, reeds) called Shanyutan. It is an important migratory stop-over to Black-faced Spoonbills. More than 300 birds were seen annually during migration. Only few records of birds in winter or summer.
Wetland type: Estuarine tidal flat
Land ownership and land use: Tidal flat is state owned. Local people farming fish and ducks in the area.
Contacts of management authority/authorities: Forest Department of Changle City.
Threats: Main threats are fish farming and duck farming at the area.. Disturbancew from human activities and boat traffic.
Conservation measures taken: A county level nature reserve was established in 2003
Contacts of local researcher/conservation organizations: Fujian Wildlife and Wetland Monitoring Center., Fujian Bird Watching Society.

Fujian Province :Tsihu[9] Lake, Jinmen[10] Island (Under Taipei administration)

Location: 24 deg 27 min N, 118 deg 24 min E.
Area: 3780 ha
Simple description of the site: Jinmen islets are situated east of coastal line of Fujian Province, China. Tsihu Lake originally was an outlet of Hsuangli Lake and was dammed and became a lake. Currently it is the ecological protection area of Jinmen National Park and includes fish ponds, reservoirs, marshes, windbreak forests and farmlands. A maximum of 16 Black-faced Spoonbills were recorded during migration season.
Wetland type: Artificial ponds
Land ownership and land use: 90% Government owned, 10% private fish ponds.
Contacts of management authority/authorities: Jinmen National Park
Threats: development pressure from business groups.
Conservation measures taken: Jinmen National Park was established in October 1995.
Contacts of local researcher/conservation organizations: Wild Bird Society of Jinmen

Guangdong Province: Gongping Dahu

Location: The area covers three areas: Gongping (23deg03'-23deg07'N 115deg23' – 115deg29'E), Dongguan Lian'anwei (22deg53' – 22deg50'N, 115deg19' – 115deg 12'E), Dahu (22deg50' – 22deg53N 115deg30' – 115deg37 E), Haifeng County of Guangdong Provoince.
Area: 11,590 ha (Gongping 4,703 ha, Dongguan Lian'anwei 4,501 ha, Dahu 2,386 ha)
Simple description of the site: The nature reserve is consisted of three parts: Dongguan Lian'anwei is fish ponds reclaimed from tidal flat, Dahu is estuarine wetland and Gongping a reservoir.
Wetland type: A rather diverse system with freshwater, brackish and saline habitat, both natural artificial.
Land ownership and land use: State land but local community has the land use right in fish farming.
Contacts of management authority/authorities: Reserve Management Office of Guangdong Haifeng Gongping Dahu Provincial Nature Reserve, 2F Forestry Bureau, Yunlin Road, Haifeng County, Guangdong Province, China 516400.
Tel: +86-660-6891955 Fax: +86-660-6863550.
E-mail: zengxianwu@sohu.com or hflinye@163.com
Threats: Large areas of mangrove forest were reclaimed as fish ponds in the 1970s. The fish ponds have become regular feeding ground of Black-faced Spoonbills and conflicts between fish farmer s and bird conservation increases. Some poaching of migratory

9 Also transliterated as Cihu
10 Also transliterated as Kinmen or Quemony

waterbirds have also been reported.
Conservation measures taken: The site has been established as a provincial nature reserve with 10 reserve staff.
Contacts of local researcher/conservation organizations: Dr Hu Huijian, South China Institute for Endangered Animals, Xingang West Road, Guangzhou City, China.
Tel: +86-20-84191955

Guangdong Province: Futian

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site:
Wetland type: freshwater/brackish/saline; permanent /seasonal; natural/artificial (with percentage); principal vegetation (% coverage)
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Hainan Province: Houshui Bay

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site:
Wetland type: freshwater/brackish/saline; permanent /seasonal; natural/artificial (with percentage); principal vegetation (% coverage)
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Hainan Province: Beili Bay

Location: geographical coordinates and administration units
Area: in ha
Simple description of the site:
Wetland type: freshwater/brackish/saline; permanent /seasonal; natural/artificial (with percentage); principal vegetation (% coverage)
Land ownership and land use:
Contacts of management authority/authorities:
Threats:
Conservation measures taken:
Contacts of local researcher/conservation organizations:

Hong Kong: Mai Po and Inner Deep Bay

Location: 22deg 29’ N, 114deg 02’ E, Hong Kong Special Administrative Region
Area: 1,540 ha (area of the Ramsar Site designated)
Simple description of the site: The site locates in estuarine area of several small rivers, including Shenzhen River, San Pui River, downstream of channelised Kam Tin River, Yuen Long Creek and on the eastern part of the Pearl River Estuary area. This site also comprises of various, but mainly man-made, habitats such as intertidal mudflat, fishponds, gei wai (i.e. traditional shrimp ponds) and mangrove forest.
Wetland type: Artificial ponds. Estuarine Tidal flat

Land ownership and land use: Both Government and private land ownerships
Land use: conservation, recreation, residential
Contacts of management authority/authorities:
Agriculture, Fisheries and Conservation Department, Agriculture, Fisheries and Conservation Department, Government of Hong Kong Special Administrative Region, People's Republic of China; World Wide Fun For Hong Kong.
Threats: As described above, main threats are habitat loss and degradation
Conservation measures taken:

- Guidelines for the implementation of the wise use concept produced by the Ramsar Convention (?) A total of 1500 hectare of wetland, including the Mai Po Nature Reserve and a large portion of Inner Deep Bay mudflat, was declared as Mai Po Inner Deep Bay Ramsar Site in 1995
- Wetland Conservation Area (WCA) and Wetland Buffer Area (WBA) proposed by Town Planning Board (?) A Wetland Conservation Area was designated by the Planning Department to prevent uncontrolled development in fishponds around the Ramsar Site. A "no-net-loss of wetland policy was adopted.
- Mai Po Nature Reserve (MPNR) is designated for restricted area under the Wild Animals Protection Ordinance (Cap. 170). The boundary of the Restricted Area under the Wild Animals Protection Ordinance was extended to cover mudflats of Inner Deep Bay in 1995.
- Frontier Closed Area (FCA): area is restricted from public access. Part of the area lies within the FCA and it provides further protection from development and disturbance.
- MPNR is managed by WWFHK for conservation and education purposes.
- A monitoring programme for the Ramsar Site is run by AFCD. A baseline ecological monitoring programme for the Mai Po Inner Deep Bay Ramsar Site is being undertaken by AFCD
- What else? A wetland compensation study was commissioned in 1996 to study and recommend practical means of mitigation, identify specific areas where wetland could be restored, enhanced or created to compensate for the adverse impacts of development project on wetlands.

Contacts of local researcher/conservation organizations: Hong Kong Bird Watching Society; Ecosystem Ltd; Kadoorie Farme and Botanic Garden Corporation; Asia Ecological Consultants Ltd; World Wide Fund for Nature Hong Kong

Macao: Taipa-Colone

Location: 22deg 06' N, 113deg 32' E, Macao Special Administrative Region
Area: 80 ha
Simple description of the site: A narrow strip of muddy intertidal area formed by sedimentation at a reclaimed area (road built to connect the islands of Taipa and Colone).
Wetland type: Estuarine tidal flat
Land ownership and land use: Public land.
Contacts of management authority: Parque de Seac Pai Van, Instituto Para os Assuntos Civicos e Municipais, Coloane, Macau. Tel: +853-870277. Fax: +532-870271
Threats: Under very severe development pressure. Degree of disturbance is also very high as the tidal area lies at a major road.
Conservation measures taken: Two small protected areas established by the Macao Government in 2001. One (40 ha) located in the intertidal area.
Contacts of local researcher/conservation organizations:

Taiwan: Sitsao[11]

Location: 23 deg 03' N, 120 deg 08' E, An-Nan and Anping districts, Tainan City
Area: 1800 ha
Simple description of the site: North to the Tsengwen River, south to Yanshui river, east to Tainan Science and Technology Industrial Park and west to coast line. Abandoned salt field, fish ponds and marshes attracted migratory waterbirds stopover or wintering. It is a regular winter site for BFS, a maximum of 313 birds were recorded here.
Wetland type: Salt pans and artificial ponds
Land ownership and land use: Government owned and as Wildlife Refuge.
Contacts of management authority/authorities: Tainan City Government

[11] Also transliterated as Szutsao or Sicao

Threats: illegal occupation and reclamation of the site, stealthily dumping trash degrades habitat. wetland shrinking and habitat fragmentation because of development of peripheral area.
Conservation measures taken: 515.1 ha of Tainan City Wildlife Refuge established on November 30, 1994
Contacts of local researcher/conservation organizations: Wild Bird Society of Tainan

Taiwan: Chiku

Location: 23 deg 08' N, 120 deg 05' E, Chiku and Jiangjun Villages, Tainan County
Area: 8820 ha
Simple description of the site: The site north to Chingkunsheng, south to the Tsengwen River, east to Yancheng, and west to coastline. Very active aquaculture and fisheries with very high productivity. The northern mudflats of Tsengwen River Estuary with abundant benthos and plankton attacts vast quantities of migratory waterbirds wintering here and is also the most important roosting site for Black-faced Spoonbill, a maximum of 688 birds were recorded here.
Wetland type: Estuarine tidal flat, Artificial ponds.
Land ownership and land use: Rivermouth: public land, fishponds private owned.
Contacts of management authority/authorities: Tainan County Government.
Threats: a proposal to constructing an international airport at north of the Chiku.
Conservation measures taken: Tainan County Government designated 300 ha of most important wintering site: 'Tainan Hsien Tseng-Wen Estuary north bank Black-faced Spoonbill Protection Area' on November 1st 2002
Contacts of local researcher/conservation organizations: Wild Bird Society of Tainan

Taiwan: Pa-chang[12] Estuary

Bachang river mouth
Location: 23 deg 19' N, 120 deg 07' E, at the boundary of Beimen, Tainan County and Budai, Chiayi County
Area: ~ 300 ha
Simple description of the site: The river mouth of Bachang river, sand accumulating from the ocean currents has formed a lagoon system. The estuary and lagoon support abundant fisheries resources. thus the area attracts many water birds during migration and for wintering. A maximum of 30 birds recorded here in winter.
Wetland type: Estuarine tidal flat, lagoon
Land ownership and land use: Public land, free access for fishers.
Contacts of management authority/authorities: Chiayi County Government, Tainan County Government.
Threats: unknown
Conservation measures taken: The north of the river mouth is Haomeiliao Nature Area for protection of mangroves.
Contacts of local researcher/conservation organizations: Wild Bird Society of Chiayi, Wild Bird Society of Tainan

Taiwan: Wen-di

Location:24 deg 49' N, 121 deg 47' E, Chuan rivermouth and coastal areas, Ilan County.
Area 2340 ha
The area around Chuan was once a large marshes encompassed Chuan, Hsiapu, and Wendi and served as habitat for many migratory waterbirds. Since 1986 many area was converted into aquaculture ponds. This area is served as roosting site for birds wintering in Lanyang River Esturay, with maximum of 8 birds in April 1998.
Wetland type: Artificial ponds
Land ownership and land use: 78% agicultural
Contacts of management authority/authorities: Council of agriculture and Ilan County Government
Threats: pesticides and fertilizers pollution from agriculture practice.
Conservation measures, none
Contacts of local researcher/conservation organizations: Wild Bird Society of Ilan

Taiwan: Tatu Rivermouth Wildlife Refuge

Location: 25 deg 10 min N, 120 deg 24 min E, Tatu rivermouth, which crosses Taichung and Changhua Counties, and coastal areas

[12] Also transliterated as Bazhang

Area: 2668 ha
Simple description of the site: North to north shore of the Tatu River, south to the boundary between Shianshi and Lugang, east to the Shenggang, and west to tidal mudflats of the coastline. The habitats include intertidal mudflats, sand flats, agriculture land and fish ponds. It is important stop over and wintering site for waterbirds. It is important for BFS stopover during migration, a maximum of 13 birds were recorded.
Wetland type: Estuarine tidal flat, artificial ponds.
Land ownership and land use: 80% public land. 20% farmer
Contacts of management authority/authorities: Council of Agriculture, Changhua County Government, Taichung County Government
Threats: Pollution of domestic and industrial waste to the river. Constant development pressure.
Conservation measures taken: Established Tatu Rivermouth Wildlife Refuge on February 28, 1995. Primary protected features include: rivermouth and coastal ecosystems, birds and wildlife.
Contacts of local researcher/conservation organizations: Wild Bird Society of Changhwa

Taiwan, Lanyang River Estuary

Location: 24 deg 42', 121 deg 48', Lanyang river mouth, Ilan County
Area: 2350 ha
Simple description of the site: North to the Gongguan, south to the bank of Langyang river , west to the Provincial Highway 9, and east to the coastline. The estuary consists mostly of riparian wetlands. Together with agricultural fields on the north riverbank between Hsinnan to Meifu forming an important withering site for migratory water birds. A maximum of 18 BFS wintering here.
Wetland type: Riparian wetland
Land ownership and land use: Public land with some agriculture practices on the Estuary.
Contacts of management authority/authorities: Council of agriculture and Ilan County Government
Threats: pesticides and fertilizers pollution from agriculture practice.
Conservation measures taken: 206 ha of Lanyang Rivermouth Waterbird Refuge was established on September 16, 1996, Primary protected features include: rivermouth and coastal ecosystems, birds and wildlife
Contacts of local researcher/conservation organizations: Wild Bird Society of Ilan

Vietnam

Red River Delta

I. The coastal zone Red River Delta:
The Red River rises in the Van Nam highlands in China and flows south-east for about 1,300 km before it enters the Gulf of Tonkin in the South China Sea, through an extensive delta covering 17,000 km2 located on the north-east coast of Vietnam. In Vietnam, the delta includes the mouths of the Day, Thai Binh and Van Uc Rivers. The coastal zone of the Red River Delta covers 300 km2 comprising 12 districts in five provinces: Hai Phong, Thai Binh, Nam Dinh, Ninh Binh and Thanh Hoa (Map 1). Based on results of the previous surveys undertaken by BirdLife Vietnam Programmei,ii, the following sites are potential important for the conservation Black-faced Spoonbill:

1. An Hai
Hai An District (20°50'57"N, 106°45'10" E to 20°46'27", 106°44'41"E), Hai Phong City.

The site comprises the coastal zone of An Hai district, which stretches for 9 km between the Lach Tray estuary in the south and the Cam estuary in the north. A single Black-faced Spoonbill was observed in the Lach Tray estuary in 1996i. The site probably does not regularly support a significant population of this species.

2. Tien Lang
Tien Lang District (20°37'37"N, 106°37'48"E to 20°40'25"N, 106°42'24"E), Hai Phong City.

The IBA comprises a 13 km stretch of coastline bordered by the Van Uc estuary to the north and the Thai Binh estuary to the south.

The site regularly supports small but significant populations of Black-faced Spoonbill. This species was believed to be a regular winter visitor in small numbers, with the biggest single count being 16 birds in March 1996i.

3. Thai Thuy
Thai Thuy District (20°37'24"N, 106°37'49"E to 20°28'41"N, 106°35'13"E), Thai Binh Province.

The site includes a 16 km stretch of coastline, bordered by the Thai Binh River to the north and the Tra Ly River to the south. After Xuan Thuy, the site is one of the most important wintering areas for Black-faced Spoonbill Platalea minor in the coastal zone of the Red River Delta. Black-faced Spoonbill was believed to be a regular winter visitor in small numbers at the site, with maximum counts of 23 birds in the winter of 1995/1996i.

4. Tien Hai
Tien Hai District (20°21'54"N, 106°34'43"E to 20°14'59"N, 106°35'16"E), Thai Binh Province.

The site comprises Tien Hai Nature Reserve, to the north of the mouth of the main channel of the Red River, known as the Ba Lat River. Tien Hai is a known wintering of Black-faced Spoonbill, with a record on a group of six birds was observed feeding along the bank of the Ba Lat River in 1996i.

5. Xuan Thuy
Giao Thuy District (20°21'54"N, 106°34'43"E to 20°14'59"N, 106°35'16"E), Nam Dinh Province.

The IBA comprises Xuan Thuy Ramsar site, to the south of the mouth of the main channel of the Red River. Xuan Thuy was gazetted as a national park by the Government of Viet Nam in 2003. Xuan Thuy supports the largest wintering population of Black-faced Spoonbill Platalea minor in Vietnam, with around 60 birds each winter in recent yearsii.

6. Nghia Hung
Nghia Hung District (20°00'15"N, 106°12'05"E to 19°58'08"N, 106°06'07"E), Nam Dinh Province.

Nghia Hung site comprises 12 km of coastline, between the estuaries of the Day and Ninh Co rivers. Nghia Hung used to be an important site for Black-faced Spoonbill with a number of records during mid 1990s. However, under the pressure of rapid development in last decade, almost suitable habitat for this species was converted, double with the high hunting pressure at the site, this species unlikely to occur in Nghia Hung anymoreii.

Situated in the northern tip of the Red River Delta, Ha Nam Island is another known site for Black-faced Spoonbill.
7. Ha Nam
Yen Hung District (20°52'N, 106°49'E), Quang Ninh Province.

The site consists of Ha Nam Island, which is situated at the mouth of the Bach Dang River, the northernmost estuary in the Red River Delta. The site was believed to regularly support a small but significant population of Black-faced Spoonbill, with 3 to 4 birds was recorded in the winters of 2001-2002, 2002-2003, and 2003-2004.

④ Winter census results (1993 – 2006)

Year	Total	Korea	Mainland China and Hainan	Japan	Taiwan	Hong Kong and Shenzhen	Macao	Vietnam
Jan 94	351	-	22	16	206	70	12	25
Jan 95	430	-	21	14	286	78	8	23
Jan 96	551	15	21	31	300	99	10	75
Jan 97	535	16	58	28	298	101	13	-
Jan 98	613	25	5	75	363	146	9	59
Jan 99	586	14	3	60	380	96	12	34
Jan 00	660	20	9	99	380	90	6	46
Jan 01	828	21	72	87	427	135	36	47
Jan 02	969	29	24	107	582	139	37	54
Jan 03	1069	22	17	128	580	203	46	65
Jan 04	1206	23	91	149	632	243	50	15
Jan 05	1475	21	187	103	757	311	39	56
Jan 06	1679	24	206	155	826	346	51	74

⑤ Color-banded birds and re-sighting records as of January 2006

To be compiled by the editors

Discuss with YIO on recommendation of new color banding scheme

References

BirdLife International (2000) *Threatened Birds of the World*. BirdLife International. Cambridge, U.K.

BirdLife International (2001) *Threatened Birds of Asia: the BirdLife international Red Data Book*. Cambridge, U.K.

Chong, J. R. and T., Morishita (1996) *Report on Conservation Measures for Important Areas of Cranes in East Asia*. Wild Bird Society of Japan, Tokyo.

Collar, N.J. and P., Andrew (1988) Birds to Watch: The ICBP World Checklist of Threatened Birds. ICBP Technical Publication No.8. International Council for Bird Preservation, Cambridge.

Collar, N.J., Crosby, M.J. and Stattersfield, A.J. (1994) Birds to Watch 2: The World List of Threatened Birds. BirdLife International. Cambridge, U.K.

King, W. B. (eds) (1981) Endangered Birds of the World: The ICBP Bird Red Data Book. Smithsonian Institution Press and International Council for Bird Preservation, Washington, D.C.

Pedersen A. and Nguyen Huy Thang (1996) *The Conservation of Key Coastal Wetland Sites in the Red River Delta*. Hanoi: BirdLife International Vietnam Programme.

Nguyen Duc Tu and Le Trong Trai (in prep.) *A Rapid Bird Survey and Assessment of the IBAs in the Coastal Zone of Red River Delta, Vietnam*. Hanoi: BirdLife International Vietnam Programme.

Severinghaus, LL, K Brouwer, S Chan, JR Chong, MC Coulter, EPR Poorter and Y Wang. (1995) *Action Plan for the Black-faced Spoonbill* Platalea minor. Wild Bird Society of Republic of China, Taipei, Taiwan

Swennen, C. and Yu Y.T. (2004) Notes on feeding structures of the Black-faced Spoonbill Platalea minor. Ornithological Science. 3(2): 119-124

ANNEX 2

International Single species Action Plan

for the Conservation of the Spoon-billed Sandpiper

Eurynorhynchus pygmeus

Draft February 2007

Prepared by Christoph Zöckler and Gillian Bunting, ArcCona Ecological Consulting
and E.E. Syroechkovskiy, Jr., Russian Bird Conservation Union & Russian Acad.Sci.
Draft January 2007

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Introduction

The Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) is a small charismatic wader, related to the stints with a conspicuous and unusual spatular bill structure. It is an endemic breeder to Russia's far North East, breeding only in coastal tundra along a discontinuous line of 4,500 km. The species breeds only in limited types of habitat, mainly lagoon spits with crowberry-lichen vegetation (Tomkovich 1995, Tomkovich et al., 2002, Zöckler 2003, Syroechkovskiy 2004). The bill is used in different ways to capture food items mostly under water and in mudflats, but also in picking larger insects from tundra vegetation. It seems to be an adaptation to foraging in coastal mudflat substrates, in breeding but more particularly in the non-breeding areas. The species has always been rare and has been included as a threatened species on the IUCN Red List since the 1980's.

Expeditions of the Russian Academy of Sciences and its cooperating partners to the breeding grounds in Chukotka, Northeast Russia in 2000, 2002, 2003, 2004 and 2005 revealed a sharp decline in the globally endangered Spoon-billed Sandpiper (SBS) (Tomkovich et al. 2002, Zöckler 2003, Syroechkovskiy, 2004, Zöckler & Syroechkovskiy, Jr. in prep.). The main reason for the decline has been suggested to relate to the habitat conditions along the migration route (Syroechkovskiy, 2004; Zöckler et al. 2006, Syroechkovskiy. & Zöckler in prep). Declining numbers in observations in the wintering grounds and at major staging areas confirm the declining trend of the population (Moores, 2001, Zöckler et al. 2005) and in 2004 the species has been upgraded to globally endangered on the IUCN Red List and qualifies for further uplisting to critically endangered in the next revision. SBS is not the only affected wader in the flyway region. According to the latest global waterbird assessment 40% of the waterbird populations are declining worldwide, but the percentage is considerably higher, at 59% for the waterbird populations in the Asian region (Wetlands International 2006), further pointing to the region' s fragile status of ecosystem health.

Recognising that the species is in sharp decline led to the design of the Action Plan (AP) under the auspices of the Convention on Migratory Species (CMS). The CMS has initiated several such plans. For the Asian pacific region the Siberian Crane AP was developed in 1993 with a Memorandum of Understanding and a conservation plan (UNEP/CMS 1999). In 1995, an AP was developed for the Black-faced Spoonbill by BirdLife partners in Asia (Severinghaus et al. 1995). Both are very successful and will serve as the main model for the AP for the Spoon-billed Sandpiper.

The AP will address all issues at sites along the flyway, ranging from the breeding grounds, on migration to the wintering sites. In order to safeguard the globally threatened population immediate and internationally coordinated action is needed. The mechanism of an international

action plan has been proven to be adequate for improving or coordinating conservation efforts. It is the aim this document is to provide summary information on status and threats, to develop a concerted plan of action in the context of the overall flyway of the species and to agree on as many activities in all range countries as possible. The AP is coordinated and steered by BirdLife Asia and is based on a voluntary process, carried out by governmental and non-governmental bodies and is not legally binding. The process could lead to a Memorandum of Understanding (MoU) under the CMS, as has been developed already, e.g. for the Siberian Crane, the Slender-billed Curlew, two more bird species, marine turtles and a deer species. Whereas an MoU is a multilateral environmental instrument and legally binding on the agreed action items for its signatories, most importantly it will generate funding for implementing the activities. It is not necessary for countries to be a member of the CMS in order to sign the suggested MoU. Most countries within the range of the species flyway are not members of the CMS at present.

Action plans serve as the main tool for promoting and coordinating conservation at the regional level. This will provide guidance for conservationists, researchers and concerned coastal managers over the next few years and in this respect serve as a model for the forthcoming Asian Pacific Australian Flyway Partnership in further advancing the Migratory Waterbird Conservation Strategy.

The plan outlines an internationally agreed list of activities, wherever necessary along the flyway, to improve the understanding of the species' requirements and conditions, to halt its decline and safeguard its long-term survival. The action plan is also the product of a consultation process as part of a species workshop held in Samut Sakhon in Thailand in December 2006. The plan will need to be seen as an ongoing process in close collaboration with various stakeholders in each range country and internationally and will ideally be drafted in consultation with representatives from each range country.

Biological Assessment

General information	The species is an endemic breeder to Russia's far North East. It also only breeds in coastal tundra along a discontinuous line of 4,500 km. The species has never been recorded breeding further than 5 (and exceptionally 7 km) from the seashore and breeds only in limited types of habitat, mainly lagoon spits with crowberry-lichen vegetation (Tomkovich 1995; Tomkovich et al., 2002, Zöckler 2003, Syroechkovskiy 2004). Its conspicuous spatular bill is used in a different fashion to capture food items mostly under water and in mudflats, but also in picking larger insects from tundra vegetation.
Population trend	Serious population decline, to one third over the last ten years. The decline of SBS numbers can be estimated as about 3 times in the last

	decade and may be as much as about 80% in the last 40 years. For details see table 1.
Distribution throughout the annual cycle	Breeding in Chukotka and the very north of Kamchatka, NE Russia, it arrives on the breeding grounds in early June. First chicks hatch around end of June, early July and fledglings occur in late July and August. Most birds leave the breeding area by mid August and migrate across the Sea of Okhotsk. First migrants are observed in Japan and Korea from early August with the peak in late September. By the end of October first migrants arrive at regular staging sites in the Gulf of Thailand, where some birds stay over winter. Wintering birds in Bangladesh arrive at the end of November with some birds staying until April. By then most birds have started migration passing Chinese coasts between March and May, reaching Korea in April with the peaking in mid May, and Kamchatka in late May before arriving back on the breeding grounds.
Productivity	The overall productivity varies between the breeding regions. • In the North the breeding success is much lower due to predation by foxes and avian predators, and other unknown reasons. • Southern breeding areas demonstrate a good breeding success in most years, for details see table 2. • Recruitment: see table 3

Life history	**Breeding:** Breeds in single pairs or small aggregations (2-5 nests over a distance of 200-500 m) on coastal tundra on the Chukchi and Bering Sea	**Feeding:** On the breeding grounds mainly practises pecking (plover type feeding) and very limited 'probing'in shallow water. This latter type of feeding is believed to be the key technique at non-breeding grounds though observations are insufficient.	**Migration:** Wintering on coastal mudflats between Vietnam and Thailand in the East, and East Bangladesh in the west. Stop over sites in Mainland China, Taiwan, Hong Kong, Japan and Korea.

Habitat requirements	**Breeding habitat:** Mainly gravel spits covered by crowberry-lichen-moss tundra at coastal lagoons, deltas and estuaries; limited breeding in moraine hills nearby to spits	**Winter Habitat:** Poorly studied. Prefers mixed sandy tidal mudflats with uneven surface and very shallow water, mainly in the most outer parts of deltas of rivers and outer islands, often with a higher sand content and thin mud layer on top. In the areas with total coastal conversion it favours certain stages in the management of saltpans.	**Habitat on passage:** See winter habitat

Population Status in the Breeding Areas

The species is confined to breed only in Chukotka and the most northern part of Kamchatka in the Russian far North East. Table 1 summarises the status of the species in its breeding area and Map 1 shows the present breeding distribution. More detailed information of the situation on the breeding grounds is available in a paper in prep. (Zöckler & Syroechkovskiy Jr. in prep).

Table 1: Population Trends

Period	**Estimate (in pairs)**	**Comment**	**Source**
1970s	2,000 – 2,800	Based on calculated estimates from a limited number of surveys	Flint & Kondratyev 1977
2000	<1,000	– based on recent expedition into the breeding areas with previously known estimates	Tomkovich et al. 2002
2002	560-900	– current figure if population declined 3-5 times since mid 1970s	Syroechkovskiy unpubl.data.
2003	402-572	-based on surveys carried out until 2003 with 30% error incl.	Syroechkovskiy, 2004
2005	350 - 380	– current optimistic estimate based on 70 % survey coverage	(Syroechkovskiy & Zöckler in prep)

Zöckler & Syroechkovskiy (in prep.) showed a very low return rate among the very site-confident juveniles ringed in previous years in the prime breeding area of Meinypilgyno, South Chukotka, indicating overall an extremely low recruitment to the population and an alarming signal of a population on the brink of extinction. A summary from counts at major staging and wintering areas, mainly in Korea also confirms a very low juvenile %. Only two juveniles were identified among 180 SBS seen at Saemangeum, in September 1998 (Moores, 1999).

The first efforts of ringing SBS on the breeding grounds date back to 1986-1988 in Northern Chukotka (Tomkovich 1994, 1995). Ringed birds have been recorded from Bangladesh in 1989 and extraordinarily only 200m and 1km from the site of ringing, back on the breeding grounds in 2002 after 14 and 15 years respectively (Tomkovich 2003). Since the surveys by the Expedition of Russian Academy of Sciences started again in 2000 over 450 birds (adults and pulli) have been ringed in both parts of the breeding range (see table 4).

Other recoveries exist mostly from Japan with a high observer density, but also more recently from Korea, Thailand and China (see Table 5, 6 and Figure 15 in Annex).

Status and Trends in the Non-Breeding Areas

In order to compile all the existing knowledge of SBS distribution and population, a geo-referenced species database was created in 2004 (Bunting & Zöckler 2006). Currently there are approximately 800 individual SBS observations listed in the database.

Table 3 in the Annex shows a summary of the more recent information from the species database by year in order to demonstrate population trends. However the numbers seen every year are low, even when compared with the most conservative population estimates from research on the breeding grounds. This suggests that only a small proportion of staging and wintering birds are seen each year and that the increase in numbers in the last few years is almost entirely due to increased observation and better publication and recording of the data.

Figure 1 shows the distribution of all SBS sightings along the flyway. It has been produced using information from the SBS database, which has been developed as an ongoing effort to understand the wintering distribution and migration patterns of the SBS.

Status and trends at National Level

The species migrates through some 12, possibly 14, countries with some presumed accidental observations from the Philippines, Canada and Alaska. Figures 2 to 14 show the data at a more detailed, national or regional scale. Table 4 lists the status, trend and habitats within each country or region.

The Chinese coastline accounts for more than 30% of the length of SBS flyway. It is therefore of critical importance for the species. Because of the vast areas involved the coastline is here split into three regions. Although the region is relatively well covered by wader counts (Li & Mundkur 2004), many potential sites were never specially surveyed for the presence of SBS, which are often mixed with big flocks of Red-necked Stints and other shorebirds (such as, Broad-billed Sandpiper Dunlin and Plovers) and therefore easily missed.

Table 4: Status, trend and habitat during non-breeding season

Country / Territory	Species Status*	Degree of Monitoring*	Pop. Trends since 1990	Main Habitat Types
Bangladesh	Previously considered to be the main wintering area with flocks of well over 200 birds in the late 1980s and still is one of the most important wintering areas with regular sightings of up to 25 birds annually	Annual mid-winter counts provide a snapshot. Regular monitoring of key sites is increasing.	DEC	Large mudflats in Eastern delta. Mostly on recently emerged islands and more stable areas along the East coast, intertidal mudflats with sandy substrate but muddy layer at the most southern tip of the country. Feeding in drier harder places, never in water, in a fine layer of sand on loamy mud.
India	Only irregular visitor to East coast of India up to 4 birds regularly in Calimere until 2004	Annual mid-winter counts made at Chilika Lake. Few observations from other sites	STA	Sand banks and mudflats in major estuarine systems mixed with clay. Not found in salt pans. Not found in Sunderbarns Mangroves Partly submerged island in Brackish Chilika Lake
Myanmar	Very recent new data give indications that this country is an important potential wintering area. Recent data need verifying.	Currently very little. Recent Irrawwady delta surveys didn't find SBS; observations from Arakan region suggest gradual decline in the last 6 years.	DEC	Mudflats in north and in gulf of Martaban probably more important than Irrawaddy delta
Thailand	Low numbers of up to 15 birds are regularly seen throughout migration and winter seasons	Regular monitoring of Inner Gulf sites	STA	Traditional salt pans near extensive mudflats in Inner Gulf. Mudflats in the gulf are estimated by Eftemeijer and Jukmongkol (1999) as 235 sq km, with salt pans 106 sq km, and prawn ponds/coastal flats 400 sq km
Vietnam	Regular visitor to the Red	Many recent records originate	STA	Outer delta sandbanks in large

	River Delta, recorded once from the Mekong Delta	from international bird watchers and tour groups. Monthly surveys in the Red River Delta		river estuaries (Red River and Mekong), not observed on salt pans
Malaysia	Rare visitor	Little	No data	
Singapore	Rare visitor	Regular	No recent observation	
China, North East / Yellow Sea	Very important stopover sites	Surveys in early 1990's, little recent data.	DEC	Not known
China, Eastern	Few recent data with max 8 birds	Increasing	DEC	
China, Southern	No data. Potentially important	Monthly and Increasing	INC, due to increase of observer activities	Sandy beaches and few records on salt pans
Hong Kong, China	Annual spring migrant, rare in autumn and a single record in January.	Weekly monitoring during migration season. Important time series data	FLU	Muddy intertidal flats
Taiwan			No recent data	
South Korea	Very important stopover area with 30 sites. Some of the largest flocks with almost 200 birds in the late 1990's.	Good regular monitoring	DEC	Outer river estuaries with sandy mudflats (only two major estuaries left, after major embankments in 2006)
DPR Korea	Few records. Potentially very important staging areas	Not known	No data	Largely unknown but Mundok mudflats appears to be important site
Japan	Important stopover sites along almost all coasts, but small numbers up to 5 birds max	Good regular monitoring plus local groups. Hundreds of observations known	DEC	Intertidal mudflats, which decreased from 1950-1990, c.70% of natural coastal areas were developed, latest in 1997
Russia (on migr.)	Important pre-breeding stopover sites, as last refuelling station before breeding grounds and early autumn stopovers	Some monitoring by ornithologists, but not enough to define the trends	Few data from Sea of Ochotsk do not suggest any trend	Coastal areas, sandy and muddy beaches and spits

* see also country maps (Fig 2-14) in annex

Key: DEC = Declining, STA = Stable, FLU = Fluctuating, INC = Increasing

Threats on the breeding grounds

The threats on the breeding area can be summarised into five categories, based on the research carried out at 30 breeding locations visited between 2000 and 2006, with special emphasis on the two main breeding areas of Meinopylgino, South Chukotka and Belyaka, North Chukotka:

1. Habitat degradation and fragmentation
2. Natural predators
3. Anthropogenic disturbance
4. Collecting of skins and clutches
5. Climate change

1) Habitat degradation and fragmentation

Significant breeding habitat degradation was observed in 5 of 30 visited breeding locations. On the west coast of Provideniya Bay about 80% of the habitat was changed by military activities, causing the total loss of SBS population in the area. The building of country houses in former SBS breeding sites is reported from Lakhtina Lagoon and road construction had transformed the habitat near the town of Egvekinot. Serious damage to several sq km of the best SBS crowberry habitat has been observed on the spits of Uel'kal' in the North and Meinypilgyno, South Chukotka. Some influence of habitat transformation by caterpillar tracks, road construction and gravel collecting in 2005-06 for construction works has influenced the breeding sites south of Anadyr airport and north at Nikolaya spit. Despite low human population density in the breeding areas human transformation may influence some of the best SBS habitat on the spits.

2) Natural predators

Natural predation on the Spoon-billed Sandpiper is lower than in many other Arctic waders (Syroechkovski & Zöckler in prep.). In the southern part of the distribution, there are only Red Foxes (*Vulpes vulpes*) and avian predators, such as gulls and skuas. In the northern part of the breeding areas, on the Chukchi Peninsula, Arctic Foxes (*Alopex alopex*) are responsible for the considerably higher losses of nests and chicks. Between the 1950s and mid 1990s the Arctic Fox population was under severe pressure from the local population, hunting and trapping foxes along the sea coast, where traditionally the largest proportion of the hunting (80%) has been carried out. Since the mid 1990s the fox numbers have increased. The annual hunting bags contained 2200-8100 animals during 1933 and 1988. After 'perestroika' the price for furs fell sharply and the annual numbers of trapped foxes declined to only 100- 300 animals (K.B.Klokov in lit). Although no exact figures are available it is most likely the fox numbers have increased sharply. Targeted studies are necessary to confirm the trend and likely impact. However, the continuing decline of SBS in other areas without any Arctic foxes invite researchers to look beyond the local predators.

3) Anthropogenic Disturbance

This factor includes disturbances by local people, as well as by the research and monitoring activities themselves.

Although Chukotka is very thinly populated, 90% of the population lives along the coast, and 75% live near to SBS breeding sites. There are 20 settlements and over 50 fishing camps in the vicinity of breeding SBS (Syroechkovski 2004). Considering the high site fidelity of the species the constant presence of human habitation so close to the breeding sites does have an impact. Examples from the well-studied area of Meinypilgyno indicate frequent hunting, fishing and recreational activities, for which local people regularly pass through SBS breeding sites. The people have little or no knowledge of the species and its globally threatened status. Unleashed dogs accompanying the local people are also very dangerous for the Spoon-billed Sandpiper. These often roam in the neighbourhood, out to a radius of some 5 km, in search of food and in pursuit of their natural hunting instincts. Mostly they focus on ground squirrels and eiders. They seem rarely to be successful, but Spoon-billed Sandpiper nests in the close neighbourhood of the village have always been predated, and dogs are the most likely culprits. In many Chukchi villages shooting at waders using slingshots is popular activity of children, which is sometimes even supported by elders as it "may help them to become a good hunter in the future ". Luckily this may influence SBS only near settlements. We have recorded these activities at least in 4 villages within the SBS range.

Research and monitoring activities, especially the capture of adult breeding birds on the nest, can cause significant disturbance although is considered vital for conservation research. SBS does react to the presence of observers and to being caught in the same way as other *Calidris* waders. Therefore only experienced, well-instructed and trained researchers should be allowed to catch and ring these birds. Two out of 76 nests found by researchers were abandoned after being monitored, presumably due to the observer influence. Nest finding and marking may also increase the predation rate by Arctic Foxes in North Chukotka. The absence of Arctic Foxes suggest that this might be one reason for the higher proportion of successful nests on the spits in South Chukotka. However, the increase of predation in the Meinypilgyno moraine hills in 2005 might be due to a Red Fox following the researcher's activity. Additional caution is needed and future research should build on a voluntary code of conduct for researchers working on SBS, especially on nesting birds in Russia, considering the species' current status.

4) Collecting of skins and clutches

Being a rare and charismatic bird, restricted to very remote areas of the Russian Arctic, SBS has always been a target for museums and private collectors. As with many other rare species (Courchamp et al., 2006), the rarer the SBS becomes the more attractive the species is amongst collectors. As it was in the last decade, it is impossible to get an official permit for collecting the species. All of the recent activities were illegal and therefore difficult to document. Several

skins of the SBS now in collections of the Zoological Museum in Seattle, were collected as recent as the early 1990s, and brought the local population at Nikitikha river estuary, south of Anadyr to extinction, as observed in 2000 and 2005. In several other cases we received reports from taxidermists or oral reports from local people, who guided well-paying collectors to SBS breeding sites. Most of these cases have been confirmed by different sources and there is no doubt about ongoing activities in collecting skins and clutches. There are at least 3 sites where we failed to find breeding SBS for several years after visits of collecting expeditions: Kivak Lagoon and Plover Spit near Provideniya, which were visited by American private collectors, who came via Nome in early 1996-98 and Gek Spit at Anadyr Estuary, visited by a Swiss-French taxidermist expedition in the mid 1990s. In the year 2005-06 several private collectors from Western Europe offered to pay several thousand US for one dead SBS. The announcement was made through the network of game biologists and hunting tourism agencies in Moscow, Saint-Petersburg and Anadyr. Collector expeditions are operating in Chukotka almost every year and among many other sought–after species is always the SBS. So far 17% of SBS breeding sites have suffered due to collector activities and several others are likely affected. In one case the culprit admitted his activities and mentioned that the value of one clutch would cover his travel expenses plus additional lucrative profits. There is a danger that more local people will become involved in collecting SBS for high remuneration. A system of self-guarding key SBS breeding sites by local communities needs to be developed.

5) Climate Change

The breeding area is part of the Arctic predicted to be the most heavily influenced by global climate change within the whole circumpolar Arctic (Grebmeier et al., 2006). As the coastal lowlands at about sea level are expected to suffer from ocean level rise (ACIA, 2005) it is clear that SBS breeding in the most impacted area. The breeding grounds are the only part of the species range which may already start suffering from climate change related events.

For the Bering and Chukchi Sea coasts of Chukotka there is evidence of:

1) Decrease of sea ice coverage in June-July, which increases the probability of floods during breeding period and wave erosion of best breeding habitat.

2) Rising of the annual and summer temperatures, with changes in vegetation from crowberry tundra to richer, multi-layered bushy vegetation much less suitable as habitat for the species.

3) Decrease of precipitation in both winter and spring, with a drying of the tundra habitat, which has been observed already. Local authorities in Anadyr report an increase in tundra fires around Anadyr over the last 20 years. A recent study carried out at the University at Fairbanks in neighbouring Alaska concluded that Arctic lakes are drying up with a loss of lake surface area of 11% since 1973 (Hinzman et al. 2005).

Depending on the exact geographical location and microclimate conditions, this could mean significant changes for the key SBS breeding habitats – the lagoon spits.

Threats on the staging and wintering areas

This section gives an overview of the most common threats on the non-breeding grounds, with a table summarising the threats by country or territory and their significance. Numerous human activities, which may influence Spoon-billed Sandpipers in coastal non-breeding areas were grouped into the following categories, based on the expert consultations of the range countries during the Action Plan Workshop in Samut Sakhon, Thailand in December 2006:

1. Large Scale Reclamation
2. Urban / Industrial Development
3. Rural Development
4. Coastal Defences
5. Conversion for Salt Pans
6. Conversion for Intensive Aquaculture
7. Mangrove Plantation
8. Tourism and Recreation
9. Hunting and Trapping
10. Pollution
11. Hydrological Regime Changes
12. Climate Change

1) Large Scale Reclamation

Coastal reclamation has many roots. The most important driver is land claim for agriculture and coastal development. Large-scale reclamation projects have taken place in the most economically developed areas of the SBS non-breeding range, first of all in Japan, South Korea and China. In **Japan** over 70% of existing intertidal areas have already been reclaimed with the largest project only completed in 1997. Other countries, such as Korea and Bangladesh also have significant, ongoing reclamation projects. In fact the largest ever reclamation project was completed in 2006 in **South Korea** with the Saemangeum reclamation claiming 40,000 ha of intertidal mudflats (Moores, 2001; Moores et al., 2006.). This project is in the process of destroying the best known stop-over site of the SBS. Coastal reclamation is not a new phenomenon. There is evidence of large-scale reclamation in Hangzhou Bay, just south of Shanghai, **China** as much as a thousand years ago (Ruesink and Wu 2005). Recent data (Ruesink & Wu 2005) suggest that reclamation in China is still increasing. Table 7 shows the increase in reclamation over time in the Cixi region, Hangzhou Bay (Ruesinck & Wu 2005).

Table 7: Area reclaimed in the Cixi region, Hangzhou Bay, China (ha) (Ruesink &Wu 2005)

Year	1047 - 1471	1472 - 1724	1725 - 1734	1735 - 1796	1797 - 1861	1862 - 1908	1909 - 1959	1970 - 1979	1980 - 1989	1990 - 2001	**Total**
Area Reclaimed	12400	10750	9860	6810	4120	11970	7260	3290	2160	6230	**74850**

In another area of Hangzhou Bay (Qian-tang region), conversion activity showed a different pattern. Strong tides occur monthly in the Qian-tang region, which makes reclamation activity more demanding and expensive. Therefore, major reclamation did not occur until after the 1950's. The pace of the reclamation has accelerated in both regions. This trend will be likely to continue in the short term, as the demand for land increases. Most of the reclaimed areas are used for agriculture, based on field observations, even on newly-converted lands.

Barter (2002) estimated approximately 37% of intertidal mudflats in the Yellow Sea, have been reclaimed since 1950. There also are plans to reclaim a further 43% of the remaining mudflats.

2) Urban / Industrial Development

Overall, coastal development in SE Asia is accelerating and reaching a pace which is unprecedented in any other region in the world. It includes development for industry, housing, tourist and transport infrastructure (e.g. hotels and golf courses) jetties and terminals. Among the known important sites a new jetty in **Bangladesh**'s most southern point to take tourists to St Martins Island was constructed in 2006 with further development threatening this area.

Plans for a huge bridge project over part of the Inner Gulf of **Thailand** have been put on hold at present, partly as a result of concerns raised by the Asian Tsunami of 2004. This is extremely good news, as two important SBS sites would have been directly affected by the development. However, less than 1 km from the highly important Pak Thale site in **Thailand** a new petrochemical refinery occupying one sq km of land is under construction. Additionally a textile factory was illegally constructed in part of the Khok Kham site.

Examples of urban expansion in coastal areas are well known from **Singapore** and **Hong Kong** and most other countries in the region. The planned 'eco' city of Dongtan near Shanghai in **China**, is of particular concern as despite the stated intentions of low impact sustainable development, the site is very close to areas currently used by migrating SBS (eastern Chongming Dao in Fig 8). It is difficult to see how large-scale development can occur without causing a negative impact on the species.

3) Rural Development

In some Asian coastal areas, overpopulated by humans, inter-tidal areas are increasingly used for conversion into land for new settlements. It is especially a problem in Bangladesh – the country with highest human population density in the world. Most reclamation activities in this country do not result from large projects, but constant creation of small new dikes. A great proportion of the existing intertidal areas are already converted for new human settlements and even the newly emerged islands are considered for this (Ul Haque pers.com). Local people on the ground in some of these areas confirmed observations that large tracts of Mangrove forest have been cleared for agriculture. More worrying for the fate of the SBS, areas of newly formed

mudflat are being surrounded by dykes and used for shrimp ponds and saltpans. The actual reclamation seems to be an ongoing process and the pace of the expanding dyke building is worrying with many suitable areas lost every year.

After detailed surveys of SBS in Bangladesh, several intertidal areas most important for the species' survival should be listed and protected from further development of new settlements.

Similar processes are believed to occur in **Myanmar** and **Vietnam**, but no detailed data are yet available. There have, as yet, been no significant coastal mudflat reclamations in **Thailand**.

4) Coastal Defences

Increasingly, coastal defences are established to prevent coastal wave erosion and floods. This includes the construction of dikes at various levels and of different types, ranging from clay to concrete walls, and even various industrial garbage like used tiers in Thailand. There are thousands of km of coastal defence constructions in East, South, and South- East Asia which are growing under the threat of potential sea level rise in connection with climate change. These constructions destroy the high tide roosts of waders and influence the hydrological regime of streams and rivers, changing this way the whole littoral ecosystem functions. They are suspected to influence SBS habitats in the Inner Gulf of Thailand (Ph.Round – pers. comm.) and some locations of Vietnam and South Korea and along the eastern coast of Bangladesh in the Chittagong area. Coastal areas and mudflats become less dynamic and the coastline is much more restricted by dams and polders for coastal protection but also increasingly for aquaculture.

5) Conversion for Saltpans

Salt Pans – big fields of flattened coastal areas divided by grids of small dikes and flooded by shallow seawater for evaporation, are one of the main types of habitat, where SBS have been recorded in the non-breeding grounds in last decades, particularly in **Thailand** and **South Korea** (where used as high –tide roosts). In the Inner Gulf of Thailand they are a key man-made habitat, completely converted from the natural state of mudflats, which used to serve as feeding habitats and high-tide roosts for waders. These saltpan habitats still play a role for SBS providing suitable feeding and roosting sites in Thailand. But the very low numbers of species in the saltpans may indicate that they are only a poor replacement for former natural habitats. Only certain types of little disturbed saltpans, in certain stages of the saltpan management are suitable for waders including SBS. Saltpans in Bangladesh are either too disturbed or of a different character and do not replace adequately the habitat requirements to serve as good wader habitat. Recently a change from salt production in favour of aquaculture, for example for shrimp-farming has been reported in most of South East Asian countries– a more profitable and less labour-intensive activity for local people.

6) Conversion for Intensive Aquaculture

The development of aquaculture is often connected with, and the consequence of, coastal reclamation. It does provide habitat for some waders, but it is largely unsuitable for SBS. In most cases, the intertidal exchange of seawater is interrupted, water levels are too high and the vital sources of food are not available.

East Asia is a leader in world aquaculture. China produces more aquaculture products than any other country and the export value shrimps from Thailand make it a world champion as well (Nikanorov, 2006). Developments in aquaculture in recent years accelerated the development of shrimp farms, often in connection with saltpans and with devastating consequences for coastal mudflats, mangroves and waders relying on the intertidal exchange of saltwater. The shrimp farms are temporarily very lucrative and based on increasing global demand. In the short term aquaculture supports the local economy but local people switch from small-scale fishing and become increasingly vulnerable to changes in the global market (WRI et al. 2005).

Coastal aquaculture is an old traditional practice in **Bangladesh**, but since the early 1970's when the demand for, and price of, shrimps in the world market became very high, much emphasis has been given to culture of *bagda* shrimp, *Penaeus monodon* rather than fishes, and shrimp culture expanded rapidly in the mangrove and polder areas. The culture operation of 51,812 ha (in 1983-84) was expanded to about 142,110 ha (in 1993-94) with the majority along the Eastern shores. More recent figures are not available. (Mahmood, 2004). The small-scale fisheries are jeopardised by the expansion of certain aquaculture practises. In addition vital components of the coastal biodiversity diminish. Among them could well be the SBS, depending on the intertidal mudflats.

In the Inner Gulf of **Thailand** the conversion of saltpans and traditional prawn-capture ponds to deep and steep-sided intensive aquaculture ponds (especially for crabs) is a threat. This is linked with the incentive to excavate and sell coastal sediments for use in construction.

7) Mangrove Plantation

Another often-ignored issue is the plantation of mangroves to stabilise newly deposited mudflats. Although plantations are often intended to compensate for losses elsewhere through deforestation, they can cause serious disruption and convert attractive roosting and feeding sites for SBS into unsuitably dense mangrove monoculture. Careful management and planning in the framework of Integrated Coastal zone management can take the needs of waders into account as well as providing coastal protection. Mangroves and mudflats do build an important ecological unity, but a one-sided plantation programme can jeopardise the species' habitat requirements. Mangrove plantation is known to take place in Xuan Thuy NR, Red River Delta, **Vietnam** – one of the main site of this species and in **Bangladesh, Thailand** and **Myanmar** potentially conflicting with habitat requirements of the SBS.

8) Tourism and Recreation

Increasing tourism requires a lot of development and often reclamation. These threats have been mentioned already above. In addition tourism, recreation and also fishing activities and transport increasingly puts pressure on the remaining beaches and wader roosts and feeding places. These activities by people, visiting beaches and mudflats can influence the timing of bird feeding, the resting and finally the success of their energy intake needed for long migrations and ultimately their survival. A small impact from this threat is reported from nearly all countries of the non-breeding range of SBS, especially taking into account that the species is often using sandy spits, which are attractive for tourism.

9) Hunting and Trapping

Hunting and catching of waders is still a widespread practise in many of the range countries. Lane et al (1994) mention organised night catches by local people in the Xuan Thuy coastal wetland, **Vietnam**, a site which is regularly visited by SBS (Table 13), could yield into up to 1,200 birds per night. The birds were marketed in the neighbouring villages. Although many villagers have given up catching birds by today, hunting still remains a serious threat in Vietnam.

In **Thailand** fishing nets set at salt pans are regularly observed, especially in the western part of Inner Gulf of Thailand, by local people, especially immigrant workers (P. Round, pers. comm.). Mist-netting of waders for local consumption and to supply local food markets still takes place in Thailand (Round in prep). In December 2006 we observed dead small waders of unidentified species in nets just 500 m from the key remaining SBS wintering site at Petchaburi.

The island of Sonadia, off the East coast of **Bangladesh**, has hosted up to 20 SBS in recent years (Islam in lit). Although in 2006 no SBS were found, the island seems to be an important roosting site for the species. Local people, interviewed on January 20 reported that 15-20 people are still regularly catching birds with nets. The interviewed person estimated that the per-season total yield is close to 700-800 birds. Most of them were Whimbrel and Curlew. He mentioned also 20-40 SBS, but after describing the features of the species, considerable doubts were raised and the figure cannot be verified. In addition waders are also shot using shotguns. Two adults were also noticed using sophisticated catapults to shoot small birds. However these two particular hunters did not know of SBS.

At Point Calimere and a number of other **Indian** wetlands potentially good for SBS along the Bay of Bengal, trapping of waders has caused up to a 5 times decline in numbers of small waders and is still taking place (Balachandran, 2005). At Chilika Lake local reserve wardens informed us of the continuing practise of netting birds over coastal wetlands, mostly aiming at bigger birds, but Calidris waders were trapped as well.

Barter (2002) reports from **China** that although tens of thousands of birds per year were trapped using clap nets in the early 1990's, this activity has now significantly reduced. In fact, in the Chinese section of the Yellow Sea, it was confined to the Chang Jiang Estuary by 2002 and reported to be declining there as well.

10) Pollution

Pollution of coastal areas has been observed in several of the sites known for the species. On Patenga beach in the Chittagong area in eastern **Bangladesh**, industrial effluent from the ship breaking industry is dumped, largely untreated, into coastal waters. Some of the channels leading into the sea near the mudflats clearly showed coloration due to pollution. Nothing is known about the effects on shorebirds or the littoral benthos community. Although results from soil sample analyses indicate low pollution rates in terms of heavy metals, data on persistent organic pollutants (POPs) are still outstanding (Grell & Schwahn in lit.).

Barter (2002) summarizes the severe pollution in the Yellow Sea, which in such an enclosed bay, suffering from reduced freshwater input from rivers is particularly serious. Birds suffer from direct contamination, but also from reduced or contaminated food supplies. Fertilisers and increasing amounts of pesticides threaten inland and ultimately coastal waters. However, little is known about the extent of use and whether thresholds have been passed which could harm waders on intertidal mudflats.

11) Hydrological Regime Changes

In some parts of the region (for example, Eastern China) large-scale projects to dam or divert the course of major rivers are expected to have a long-term impact on the sediment load they carry. This in turn is expected to have a serious negative impact on the rate of accretion of new mudflats in these areas (Barter 2002). The central Bangladeshi coastline is little affected by anthropogenic habitat destruction, but subject to constant change due to the highly dynamic estuarine processes of the Ganges-Brahmaputra system. Upstream land use changes and deforestation could be expected to have a counter-balancing effect to sea level rise. On a regular basis sediments are transported and replaced, creating new islands and habitats for waders (see map) in a short period of time. The shallow waters are constantly filled with sediments, reaching from as far as the Himalayan Mountains. However other factors, such as dams and water off-take for irrigation are also present, and it is not yet clear what the overall result is likely to be.

Not only upstream dams, but estuarine barrages can significantly affect estuarine habitats, altering patterns of deposition and length of immersion by tides (e.g. Kim *et al*. 2006), as well as salinity levels. Following the construction of an estuarine dam across the Nakdong River, South Korea in the late 1980s, numbers of many waterbird species in the estuary downstream of the barrage declined. Prior to barrage closure, "several hundred" Spoon-billed Sandpiper had been counted there (e.g. Gore and Won 1971), while in recent years that number has fallen to

less than ten annually (see figure 11). Although some of that decline might well be attributable to the decline in the total Spoon-billed Sandpiper population, many other shorebird species, such as Red-necked Stint, have also declined there by more than 90% in the past two decades (Moores, 1999; Moores in press, 2007), without showing similar declines in total population. In South Korea, several other major rivers have also been barraged, including the Geum and Yeongsan Rivers, and almost no unaltered estuarine habitat remains nationwide.

12) Climate Change

Climate Change is expected to have a major impact on coastal mudflats. In the long-term sea level rise, floods and more severe cyclones will affect wader habitats considerably. However, the impacts are so varied, difficult to predict and complex in nature that is far beyond the scope of this action plan to describe the impacts of climate change in detail. Moreover most of the impacts will be felt only in the medium to long-term.

It is felt that the direct human interference and mismanagement of coastal ecosystems at present is a more severe threat and can also be targeted and addressed within the framework of this action plan. This does not mean that climate change is not a serious threat for non-breeding SBS habitats and future years might reveal the extent of the real impact on the flyway coasts.

Table 8: Summary of Threats by Country, based on best available assessment by the Samut Sakhon workshop participants

Threat	RU	DPRK	ROK	JP	CN			VN	TH	MY	MM	BD	IN
					S	E	N						
On the Breeding Grounds													
Habitat Transformation	2												
Predation	1												
Disturbance	1												
Collecting	3												
Climate Change	2												
On the /non Breeding areas													
Habitat Change													
Reclamation for Agriculture	0	(3)	3	1	0	0	0	(1)	0	1	(1)	1	0
Conversion for Intensive Aquaculture	0	(2)	(1)	0	3	2	1	(2)	3	2	(1)	2	1

Threat	RU	DPRK	ROK	JP	CN			VN	TH	MY	MM	BD	IN
					S	E	N						
Conversion for Salt Pans	0	(?)	0	0	0	0	0	0	0	0	(2)	2	1
Mangrove Plantation	0	0	0	1	1	0	0	2	2	0	(1)	2	2
Rural Settlements	0	0	0	0	0	0	0	0	0	0	(1)	1	0
Large Scale Reclamation	0	(2)	3	2	3	3	3	2	0	0	0	0	0
Urban / Industrial Development	1	(0)	3	2	3	3	3	1	3	2	0	0	0
Tourism Development	0	0	1	0	1	1	1	1	1	0	(1)	0	0
Coastal Defences	0	(1)	1	0	0	0	0	1	1	0	0	0	0
Hunting and Trapping	1	0	0	0	3	3	3	2	2	1	(1)	1	2
Fishing activities	0	(1)	2	1	3	3	3	2	0	2	(1)	2	1
Other Human Disturbance (recreation, transport)	0	0	2	1	1	1	1	2	0	0	0	1	1
Industrial Pollution	1	0	(1)	(1)	3	3	3	1	(2)	(1)	(1)	1	(1)
Agricultural Pollution	0	(2)	(1)	(1)	2	2	2	(2)	(2)	(1)	(1)	1	(1)
Hydrological Regime Changes	0	(2)	(3)	(1)	?	(1)	(2)	(2)	0	0	(1)	0	2

3 = Critical threat with large impact, 2 = Important threat with significant impact, 1 = Impact relatively small, 0 = Little or no known impact, ( ) = Suspected to be a threat

Present Conservation Activities

National Protection and International efforts

At present hardly any conservation activities are targeted specifically to protect SBS. However, several national and international schemes for coastal protection do also serve the protection of the species to a varying extent. Some of the most important initiatives programmes and conventions are listed below.

Table 10: National species protection and Red Listing

Country / Territory	Protection Status including National Red List	Actions needed
Russia	RDB	No
Japan	Red Listed	No
China, Mainland	Low level protection	Add to regional and national Red List
China, Hong Kong	Fully protected	
DPRK	Listed, Medium level protection	
Republic of Korea	Low level protection	Upgrade
Vietnam	Has a list of Protected Species, but SBS is not on it	Include in RL
Thailand	Fully Protected, but not on the list of Nationally Reserved Species	Include in RL
Malaysia	No information	
Myanmar	All wild birds are legally protected	Upgrade
Bangladesh	All wild birds are legally protected	Upgrade
India	All wild birds are legally protected	Upgrade

Conventions and International Efforts

The following international Conventions are relevant for the protection and conservation of the species. Migratory species are specifically targeted and protected through the CMS. Multilateral agreements for specific regions have been developed and are operating for some regions, e.g. the African Eurasian Migratory Waterbird Agreement (AEWA). For the Eastern Asian Flyway the Asian Pacific Migratory Waterbird Flyway Strategy has been developed and a 5-year plan adopted up to 2005. This is due for renewal and a new strategy is under negotiation. In addition the Central Asian Flyway (CAF) has been developed to address the issues for species migrating along the Central Asian flyway between Siberia and South Asia. At present no formal agreement on this flyway has been reached. Table 11 lists the range countries and signatories of the main Conventions.

Considering both the rarity of the Spoon-billed Sandpiper and its ecological dependence on wetlands, all sites used by the species regularly should qualify such wetlands under Criterion 2 of the Ramsar Convention for designation as sites of international importance (i.e. as Ramsar sites). However, while several of the coastal wetlands important for the species have now been listed, many others have not (see Figs 2 to 14). Moreover, many of the sites used by the species are threatened by unsustainable development (as noted above), despite specific resolutions that have urged all contracting parties to "review and modify existing policies that adversely affect intertidal wetlands, to seek to introduce measures for the long-term conservation of these areas, and to provide advice on the success, or otherwise of these actions in their National Reports." (Ramsar Resolution 7.21).

Many countries appear to be failing to comply with the obligations of conservation-driven conventions, and are not integrating wetland and biodiversity conservation, and sustainable use, adequately into national land-use planning.

Table 11: Membership of range countries in International Conventions and Agreements

Country	CBD	Ramsar	CMS	EAAFP
Russia	M	M		M
Japan	M	M		M
China	M	M		M
North Korea	M			?
South Korea	M	M		M
Taiwan				
Vietnam	M	M		?
Cambodia	M	M		?
Thailand	M	M		M
Malaysia	M	M		M
Myanmar	M	M		M
Bangladesh	M	M	M	?
India	M	M	M	
Sri Lanka	M	M	M	

Party members (M) to multilateral environmental agreements, (CBD=Convention on Biological Diversity, CMS= Convention on Migratory Species, EAAFP =East Asian Australian Flyway Partnership)

IBAs

BirdLife International's Important Bird Areas Programme is a worldwide initiative aimed at identifying, documenting and working towards the conservation and sustainable management of a network of critical sites for the world's birds, termed IBAs. The Asian IBA Programme, initiated in 1996, aims to document and promote the conservation of a region-wide network of internationally important sites for the conservation of birds and biodiversity.

IBAs are identified through the application of a set of standard criteria, including sites that regularly hold significant numbers of a globally threatened species and sites that hold globally important congregations of waterbirds and other species. Many of the sites where Spoon-billed Sandpiper has been recorded meet these criteria and have IBA status (see Fig. 2-14).

National site protection (Protected Areas)

The following table 12 shows the degree of protection among all the locations where SBS has been sighted. Only 13.2% of all sites are currently protected. Considering also the low percentage of the breeding areas protected the species appears to be highly vulnerable and exposed to uncontrolled coastal development.

Table 12: Total site protection through Protected areas (IUCN Cat. I-IV) of SBS Sites by Country

Country	Number of SBS Sites	Number of Protected SBS Sites	Number of Un-protected SBS Sites	% Protection of SBS Sites*
India	11	0? (=3)	8	27%
Bangladesh	15	1	14	7%
Myanmar	5	0	5	0%
Malaysia	2	0	2	0%
Thailand	4	1	3	25%
Vietnam	5	2	3	40%
China, Mainland	29	4	25	17%
China, Hong Kong	1	1	0	100%
South Korea	24	0	24	0%
DPRK	8	0	8	0%
Japan	102	17	85	17%
Russian Federation	28	9	19	32%
TOTALS	**265**	**35**	**230**	**13.2%**

*These figures are produced using a GIS overlay of SBS sites and the WPDA 2006 database. They represent a 'first cut' at his data and there are several potential sources of error that need to be mentioned. In general these errors will reduce the percentage of sites that are classified as protected, therefore the above figures may represent an underestimate. Firstly, only an exact match between the SBS coordinates and the boundary of the protected area is included. Therefore if coordinates are inaccurate, or have been rounded to the nearest minutes, they may 'miss' the protected area. Secondly, the protected area may not be present, or accurately represented in the database. Thirdly, there may be some 'double reporting' of sites in the database, for example, where there are different names or spellings for the same site, this may falsely increase the number of sites in a country.

It is important to note that the mere status of a site as protected area does not necessarily secure the conservation of the site. In South Korea, for example several of the sites used by the species are technically protected by national legislation, and in one area, Suncheon Bay, has been designated as a Ramsar site. However, in many protected sites, such as Nakdong estuary, reclamation projects are ongoing, as well as the construction of a massive road-bridge through key habitat and the unsustainable use of much of the area by fishers.

Table 13 lists the most important sites on the non-breeding grounds over the last 6 years (since 2000). At total of 21 sites, of flocks with 2 or more birds were recorded during two or more seasons. The table reflects the state and lack of knowledge on the distribution of the species and as such should serve two purposes. For one, it highlights those sites of significance in recent times, but also demonstrates the need for better data coverage.

Table 13: Important sites for Migrating and Wintering SBS, containing 3 or more birds at the time since 2000

Locality	IBA Name	Country	No. of observations Since 2000	Protected Area	Ramsar Site	East-Asian-Australian Network Site
Saga-gun		Japan	1		?	
Tatara-gawa Estuary		Japan	1		?	
Mangyeung estuary (including Okgu)	Mangyeong estuary	South Korea	18		No	
Dongjin estuary		South Korea	8		No	Yes
Geum estuary (including Yuboo Is.)		South Korea	4		No	
Nakdong estuary		South Korea	3		No	
Mai Po Nature Reserve	Inner Deep Bay and Shenzhen River catchment area	Hong Kong, China	2	Yes	Yes	Yes
Minjiang Estuary	Min Jiang Estuary	China	2		?	
Nanan (near Xiamen)		China	2		No	
Xuan Thuy Nat. Park (including Lu Island)	Xuan Thuy	Vietnam	5	Yes	Yes	
Thai Thuy	Thai Thuy	Vietnam	1		No	
Pak Thale	Inner Gulf of Thailand	Thailand	19		No	

Khok Kham	Inner Gulf of Thailand	Thailand	6		No	
Ratheduang		Myanmar	2		No	
Shaporir Dweep		Bangladesh	3		No	
Sonadia		Bangladesh	2		No	
Point Calimere	Point Calimere Wildlife Sanctuary	India	1	Yes	Yes	

* Observations refers to the number of individual observations made, since 2000, of flocks of more than two SBS.

Proposed Conservation Activities

We can describe eight main areas of action on an international level to halt and reverse the species' decline. Each country or region can adopt the framework and design the action needed at a local, sub-regional or national level. The actions are listed and summarised in the table and further described in the text below.

Table 14: Objectives, Institutions and Proposed Timelines for Conservation Activities by country, region and institution; H= High, M=medium priority

International Objectives	**Management Options and Activities**	Priority	**Country/region/Institution**	**Time frame**
a) Species Protection				
Reconsider and potentially upgrade the threatened status on the global Red List and in all range countries.	1) Publish an assessment of the potential change in status of the species from Endangered to Critical and upgrade in the IUCN Red List, globally and in all range countries	H	BirdLife International, IUCN, all range countries, ArcCona, SBS Recovery Team	2008
Stop and prevent species persecution by museums and private collectors for egg and skin collecting.	2) Public awareness campaign, legal enforcement and the establishment of local self guarding systems at key breeding sites. Concerted action through local and national hunting organisations and museums	H	RU and non- range countries, Hunting organisations in Russia, CITES, Museum Networks, Private Collectors.	2006-2008

Stop and prevent species persecution by local hunters.	3) Upgrade the legal protection status for the species in all range states and prevent persecution by local hunters.	H	All, in particular: RU, BD, MY, VN, TH, CN,	2006-2010
b) Habitat protection				
Increase the area of habitat protected of the important breeding and stop over sites.	4) Identify Key areas for the species and improve its legal site protection and management using national legal mechanisms and collaborative international mechanisms	H	All countries and Federal agencies; Priority in RU, BD, CN, DPRK, ROK, JP and MY Ramsar, Waterbird site network.	By 2010
Improve site protection outside PA s through Flyway strategies, partnerships and agreements.	5) Endorse the action plan and integrate the activities by the East Asian – Australian Flyway Partnership	M	All Countries, Wetlands International, BirdLife International, Ramsar and CMS Conventions, Asian Australian Shorebird Network, SBS Recovery Team	By 2010
c) Site management				
Enhance the sustainable management of the important stopover and wintering sites of the species. Promote the integrated coastal zone management	6) Implement and Improve Integrated Coastal Zone Management along the entire flyway. Take the SBS habitat requirements into consideration in ICZM, planning and development. Identify key sites to promote ICZM. Make aquaculture projects subject to strategic and environmental impact assessments and promote traditional non-intensive management of shrimp- and fish ponds to maximise their value to water birds, including	H	Governmental agencies responsible for coastal zone management, International Development Agencies e.g. ADB, World Bank, USAID, GTZ etc.	2010 and beyond

	certification schemes.			
Secure the sustainable management of salt pans.	7) Develop model projects in three countries to showcase the integration of saltpan management and shorebird conservation.	M	Responsible government agencies in accordance with local people and the salt industry, particularly in TH and VN.	2007-2008
d) Habitat and site restoration				
Restore coastal habitats where possible.	8) Carry out feasibility study on restoration in technical and political terms. Identify short term and long term restoration projects.	M	Ramsar Convention (to support and advise), Wetlands International, BNHS, Aid Agencies	2007-2008
Stop further coastal reclamation	9) Revise and modify existing policies on the reclamation of intertidal areas	H	All responsible government agencies in accordance with the Ramsar Convention	By 2010
Restore SBS habitats and implement managed coastal retreat where suitable.	10) Identify potential restoration sites and arrange study tours to learn about coastal restoration methods and learn from European pilots of managed coastal retreat.	M	All responsible government agencies in accordance with the Ramsar Convention and support from donor agencies.	By 2010
e) Awareness Raising and Education				
Raise institutional and public awareness	11) Increase the awareness for SBS conservation needs through targeted campaigns at educational and federal institutions, local communities, national and international media as well as among visiting birdwatchers and the general public.	H	NGO's e.g. BirdLife Partners, JAWAN, OBC, SBS Recovery Team	2007 +
f) Capacity building				
Improve technical tool kits.	12) Facilitate and develop programmes to assist	M	All countries, RSPB Binocular Scheme.	2007+

	individuals and NGOs to have access to conservation awareness material, binoculars and telescopes for fieldwork.			
Improve field and survey skills	13) Provide training in wader bird identification and techniques in field surveys in the intertidal areas, with special focus on SBS habitats.	M	JAWAN, Birds Korea, AWSG, BCST, BNHS, HKBWS and other NGO's, Wetlands International	2007+
Improve awareness of SBS for coastal zone managers	14) Implement national activities for coastal managers and communities to increase awareness of SBS and coastal management options.	M	JAWAN, Birds Korea, BCST, BNHS, HKBWS and other NGO's, Wetlands International	2007+
g) Research & Monitoring				
Increase knowledge of species population dynamics	15) Continue to identify further key sites in the breeding, stopover and wintering grounds through inventory work, remote sensing techniques and data logger technology to identify missing key breeding and stop over sites.	H	All countries, sub-regions, Russian Academy of Science and equivalent institutions, BirdLife partners and other NGO's, Wetlands International, ArcCona Consulting, JAWAN, AWSG, Bilateral agreements (in particular: RU, CN, TH, VN, BD)	2007-2010
Increase knowledge of breeding biology	16) Continue research in the breeding areas with focus on breeding success and climate variability and changes over the last 20 years.	H	RU, Russian Academy of Science and equivalent institutions	2007-2010
Increase knowledge of winter biology	17) Improvement of ecological knowledge in the non-breeding grounds for identification of key coastal habitats and	H	BirdLife Partners, University and research institutions (e.g. RSPB and BCST partnership Inner gulf of Thailand)	2007-2010

	specification of the influence of limiting factors.			
	18) Coordinate existing conservation activities of different international organisations to avoid duplication of effort and insure most effective cooperation	H	SBS Recovery Team, BirdLife Partners, AWSG and all relevant agencies	2007
	19) Complete DNA population differentiation analyses for the needs of conservation planning	M	BirdLife Partners and the SBS Recovery team in collaboration with University and research institutions	2007-2010
Avoid possible harm through research	20) Develop and agree on a code of conduct for research, to minimise impact on the threatened population.	M	SBS Recovery Team with Universities, museums and research institutions	2007
Provide accurate trend information	21) Establish and enhance regular monitoring on key sites on the breeding grounds and on the non-breeding grounds	H	Governmental agencies, Wetland International, BirdLife International, NGO's (Birds Korea, JAWAN etc.) and AWSG, SBS Recovery Team, and KFEM.	2006-2010
Support search for suitable habitats	22) Application of Remote Sensing and GIS to mapping of remaining suitable habitats	M	Governmental agencies, BirdLife International, ArcCona Consulting, SBS Recovery Team.	2007+
Provide accurate trend information with geo-referenced information	23) Promote and populate the GIS based species database as a vital monitoring tool.	M	Governmental agencies, BirdLife International, ArcCona Consulting, SBS Recovery Team,	2006+
h) Fund Raising				
	24) Raise funding from international and national sources to support the implementation of the action plan.	H	Donor agencies, governments, all relevant bodies	2006+

a) Species Protection

ACTION ITEM 1: Publish an assessment of the potential change of status of the species from Endangered to Critical and upgrade in the Red Data Book, globally and in all range countries

At present the species is listed as globally endangered (EN). The sharp and rapid decline of the population over the last 20 to 30 years, as well as its range contraction would justify an up listing to globally critically endangered (CR), (for more details see Zöckler & Syroechkovski in prep).

ACTION ITEM 2: Stop and actively prevent species persecution and collection for museums and private collections through public awareness campaigns and local self-guarding systems. List the species on Appendix 1 on the CITES Convention

ACTION ITEM 3: Upgrade the legal protection status for the species in all range states and prevent persecution by local hunters.

In rare sub-national regions, such as Chukotka, the species is already listed as CR, however many countries have not included the species on the national Red List. In almost all countries it is not legal to persecute the species. However, until recently the species was not only hunted for consumption but also collected for museums and private collections. Hunting, catching and persecuting small waders with nets and the illegal collection of specimens and eggs is still continuing, which requires coordinated action and improved legal enforcement. Most of private taxidermy collectors and museums interested in SBS skins and clutches are from developed countries (Europe and USA). It should be possible to raise the awareness on the critical status of the species, improving a self-controlling system among museums and potential collectors.

We need to encourage CITES parties to list SBS on Appendix 1. This would immediately limit the legal trade of specimens to developed countries.

b) Habitat protection

ACTION ITEM 4: Identify Key areas for the species and improve its legal site protection and management using national legal mechanisms and collaborative international mechanisms (e.g. Ramsar and Waterbird Site Network)

Protected areas are still the most prominent and efficient measure to safeguard key habitats for the threatened species along the entire flyway. The task requires the full commitment and good coordination of all flyway countries. Again, the enforcement and management of the protected areas is essential for the tool to be successful.

All or most of the breeding areas should be declared as protected areas. At the moment the degree of protection is 32% of the breeding sites (see table) and less than 20% of the estimated breeding population. Urgent action on the designation of protected areas is required.

Many countries like Thailand do not really have any provision in their environmental or protected area legislation that allows for multiple uses, and conservation and sustainable use, which prohibits conversion to other uses. Much of the land on which SBS occurs in Thailand is already in private ownership, creating additional problems. A review of national environmental legislation in SBS countries is needed so as to determine the most appropriate country-by-country response.

- Strengthen the management of sites where necessary

- Identify Key sites, which are not currently protected and list them for future legal site protection.

- Review and identify site protection approaches and strategies which will be appropriate at the national and local level

ACTION ITEM 5: Endorse the action plan and integrate the activities with the East Asian – Australian Flyway Partnership

The Flyway Partnership can provide a Flyway umbrella for the Action Plan and potentially be adopted by the Partners as a framework for action for the SBS. The Partnership has a specific theme for endangered species. BirdLife Asia has volunteered to lead on developing this theme. In 2007 the Partnership will be very much finding its way in developing collaboration between international and national partners. The SBS Action Plan could be very useful in providing a specific checklist of actions that need to be built into the integrated delivery of awareness, capacity building, monitoring and site management activities across the Flyway.

The SBS Recovery Team could be identified by the Partners of the Partnership as focal points and invited to report to Meetings of Partners.

c) Site Management

ACTION ITEM 6: Implement and improve the Integrated Coastal Zone Management (ICZM) of important stopover and wintering sites of the species

Intertidal mudflats are considered to be an ecological unit with other coastal habitats, in particular mangroves. The protection and integrated coastal zone management (ICZM) of healthy ecosystems along the flyway needs to take this unity into account. ICZM not only benefits the species in mind but aids many others. Moreover, it will assist in secureing the livelihoods of coastal communities who depend on ecosystem services. Integrated Coastal Zone Management is based on the principle of the sustainable use and adopted for management planning but rarely implemented. In this context it is important to acknowledge coastal ecosystem services, such as coastal water purification, the buffer capacity against storm surges and providing livelihoods for small-scale fishing communities, in addition to SBS conservation.

In practise, coastal zone management comprises a wide range of activities. In effect, all coastal planning and management needs to consider the special protection requirements of the SBS. In many cases those are consistant with safeguarding other ecosystem services.

The afforestation of mudflats with mangroves can be detrimental for the species. Mangrove afforestation is important and vital to sustain coastal ecosystems, but it needs to be carefully planned and the habitat requirements of SBS are part of coastal zone management and planning processes.

-
- Improve Integrated Coastal Zone Management (ICZM) along the entire flyway
- Promote SBS habitat requirements in ICZM
- Identify key sites priorities to promote ICZM in relation to maintaining SBS habitats.
- Make aquacultural projects subject to strategic and environmental impact assessments
- Promote traditional non-intensive management of shrimp- and fish ponds to maximise their value to water birds and SBS
- Promote certification schemes for sustainably produced seafoods

In the breeding areas specific requirements have become necessary, e.g.:

- Providing the nature conservation agencies and construction companies with information on important SBS locations nearby villages to avoid disturbance and the development of these areas.
- Regulating the use of caterpillar vehicles for some restricted places, where tracks cross breeding habitats

ACTION ITEM 7: Develop model projects in three countries to showcase the integration of saltpans management and shorebird conservation

The management of saltpans might provide a crucial key for sustaining some of the wintering populations of SBS. The investigation and promotion of sustainable saltpan management could provide a suitable habitat for waders. Thailand, but also Bangladesh and China seem to have suitable saltpan areas to test the different management options of best practice for waders.

d) Habitat Restoration

ACTION ITEM 8: Study the feasibility of coastal habitat restoration in technical and political terms. (see Point Calimere, Kerala, India)

Many coastal habitats along the flyway have been converted, changed and degraded. Before we fully understand the habitat requirements of SBS many vital habitats and sites have already changed their character drastically and are no longer suitable for the species. For some areas, where we know that the species occurred historically restoration efforts can be an important activity in restoring lost habitats. However, at the moment little or no experience is available to base future restoration efforts on and a feasibility study is recommended to explore the potential and the constraints

- Identify short term and long term restoration projects

ACTION ITEM 9: Revise and modify existing policies on the reclamation of intertidal areas to promote SBS conservation.

At present almost all range countries, Especially China and the Republic of Korea undergo smaller or larger reclamation projects. In South Korea, there are three main remaining areas for Spoon-billed Sandpiper: the Nakdong estuary, the Mangeyung and Dongjin estuaries (known collectively as Saemangeum), and the Geum estuary. While the Nakdong Estuary is protected under national legislation, parts of the estuary are still being reclaimed; others areas are being degraded by road construction; and outer parts of the estuary are highly disturbed. Saemangeum is being fully reclaimed, and government authorities have not initiated adequate monitoring of the site to determine impacts of the reclamation on shorebirds, despite a formal request (Ramsar Resolution 9.15, paragraph 10) to advise the Secretary General of the impact of construction works "on the internationally important migratory bird populations dependent upon these wetlands". The adjacent Geum estuary is also slated for reclamation, to be undertaken in two phases, with permission given to reclaim, despite its extreme international importance for shorebirds, including Spoon-billed Sandpiper. South Korea's hosting of the next Ramsar

Conference of the Parties in 2008 should provide an excellent opportunity for the national government to raise public awareness about the need for conservation, and with public support to modify tidal-flat reclamation practices that are said to threaten possibly 50% of all remaining intertidal areas in the near future (see Moores, 2007 in press).

ACTION ITEM 10: Identify potential restoration sites and arrange study tours to learn about coastal restoration methods and learn from European pilots of managed coastal retreat.

Although we still know very little about the use of stop over sites, duration and preference, we can list a number of key sites within the species flyway, where we can ensure maximum protection and encourage restoration activities. It is important to demonstrate again the link with human well-being and coastal livelihoods as another incentive for the implementation of the proposed measures. Each country and region needs to decide its priorities. However, the action plan can provide guidance and sets the framework for all participants.

In many cases it will be very difficult to restore once-degraded mudflats or retreat the coastline. At present the UK and some other European countries are deliberately opening sea walls in some places, as a managed retreat to re-constitute coastal wetlands as buffers on formerly reclaimed land. This approach has its limitations and many areas cannot be reversed and restored to their original character. Rather than focusing on restoration, more improvements for the SBS could be gained by investigating on a scheme, which allows the sustainable development of saltpans, and shrimp farms, which still provide suitable habitats for waders, including SBS.

e) Awareness Raising and Education

ACTION ITEM 11: Increase the awareness of the SBS conservation needs through targeted campaigns at educational and federal institutions, local communities, through national and international media as well as among visiting birdwatchers and the general public.

- Establish outreach programmes which also explain the link between SBS protection and ecosystem health

Despite some first successes and publications, the species' plight is still widely unknown and not widely publicised. It is important to introduce the story of the decline and link it with the degradation of coastal ecosystems to a wider community including the general pubic. It is important that key information on SBS conservation needs will be available in many different languages: Russian, Chinese, Bengali, Thai and others.

The public awareness campaigns in India and Bangladesh demonstrated the high value of these activities. It is vitally important to accompany any action with an awareness and public relations campaign to secure the support of important stakeholders in the implementation process.

f) Capacity building

ACTION ITEM 12: Facilitate and develop programmes to assist individuals and NGOs to have access to conservation awareness material, binoculars and telescopes for fieldwork.

ACTION ITEM 13: Provide training in wader bird identification and techniques in field surveys in the intertidal areas, with special focus on SBS habitats.

ACTION ITEM 14: Implement national activities for coastal managers and communities to increase awareness of SBS and coastal management options.

Capacity Building is necessary in many ways. Most importantly national organisations and institutions need to be sufficiently provided with the field and data base capacity to compile and store the data requirements necessary for conservation action and research. In addition training is important to raise the awareness of the species in coastal planning and conservation activities. Wetlands International has set up training programmes in the region, which can be extended to target particular areas of conservation concern.

g) Research and Monitoring

a) Research

ACTION ITEM 15: Continue to identify further key sites in the breeding, stopover and wintering grounds through inventory work, remote sensing techniques and data logger technology to identify missing key breeding and stop over sites. (Russia, China, Bangladesh, Vietnam, Myanmar)

Without knowing where the species is in the most critical parts of the range we cannot do much for its conservation. About 75% of SBS non-breeding sites are still unknown or not properly monitored. We urgently need to improve our knowledge to more effectively plan the conservation actions. Inventory expeditions with involvement of volunteer birdwatchers from developed countries as well as trained local people should be continued. Participation of networks such as BirdLife, OBC and local nature conservation societies should be encouraged.

ACTION ITEM 16: Continue research in the breeding areas with focus on breeding success and climate variability and changes over the last 20 years.

Though good information on the breeding biology and the influence of negative factors has been collected in Chukotka, there are still open questions on the decrease in breeding success, the impact of climate and related evolution of habitat as well as changing pressure of natural predators in relation to radical shift of trapping practices and other economic changes in the Russian Arctic after Perestroyka. Multidisciplinary projects focussing on different aspects of breeding biology and evaluation of population limiting factors are required.

ACTION ITEM 17: Implement research in the non-breeding grounds for identification of key coastal habitats and ecological requirements

The basic knowledge of the species ecology and habitat preferences makes the background information for conservation of the species. The evolution and adaptive role of the spoon-shape bill in relation to its use in natural habitat is still largely unknown. Research on feeding ecology and habitat use will give a guide for selection of key sites for inventories and further conservation by extrapolation using satellite imagery. Ecological studies may also give answers to the question of key limiting factors in the non-breeding grounds and how conservation can target these factors. Detailed ecological projects on the non-breeding grounds are needed with good numbers of SBS and a variety of habitats used. The Saemangeum Shorebird Monitoring Program, a joint initiative of Birds Korea and the Australasian Wader Studies Group, is one example of a Program where such data will be gathered, through direct observation of birds and by parallel studies of benthos.

ACTION ITEM 18: Coordinate existing conservation activities of different international organisations to avoid duplication of effort and insure most effective cooperation.

The SBS Recovery team could link activities in the framework of BirdLife International work portfolio, East Asian – Australasian Flyway Partnership (Action item 5) and various national and international Shorebird (Wader) Working Groups and other state and NGO activities.

ACTION ITEM 19: Complete DNA population differentiation analyses and stable isotope analyses for the needs of conservation planning

The continuation of research is vital in our understanding of the main causes for the decline. Although progress has been made, we still lack a full understanding of breeding success, adult survival and the potential role of predation and climate change on the population. We need to

know if there is a single mixed population of the species or several subpopulations, which may be possible for a species with very high breeding site fidelity. DNA analyses in combination with analyses of ring recoveries may help in differentiating potentially different populations and thus help in site conservation planning. It also provides insight to the approximate total population size before the crash and when the crash might have started. Both are crucial in further understanding the reasons behind the decline. Furthermore we need to better understand where most of the population spend the non-breeding period and what are the main threats they are facing there. Modern research technologies, including radio tracking, stable isotope analyses and DNA analyses can provide some answers. The analyses of remote sensing will reveal further information on the gradual changes in the tundra vegetation as well as the changing conditions along the coastal habitats in the non-breeding areas.

ACTION ITEM 20: Develop and agree on a code of conduct for the research to minimise impact on the threatened population

Research activities are important to continue in order to reveal the needs of the species during the sensitive breeding period (see action item 18 and 20). However, the experience of previous years has demonstrated the need for a code of conduct for this research. Although not legally binding the researchers involved feel to obliged to comply with a self-imposed code. This will include:

- Ringing activities at the nest only undertaken with care
- Refrain from ringing further adult birds at the nest
- Reduce measurements to a minimum and aim to spend less than ten minutes near the nest.
- Refrain from publishing detailed location of the breeding sites

b) Monitoring

ACTION ITEM 21: Establish and enhance regular monitoring on key sites on the breeding grounds and on the non-breeding grounds

ACTION ITEM 22: Apply remote sensing and GIS techniques to mapping of remaining suitable habitats and their monitoring

ACTION ITEM 23: Promote and populate the GIS based species database as a vital monitoring tool

The continuation and reinforcement of the existing monitoring is vital, but requires capacity building, training and resources (see action items 12-13). All these need to be raised in the

framework of this action plan, with support of the CMS and international conservation organisations.

Priorities for the monitoring work are the following:

1) For the moment the most effective monitoring is run in selected breeding locations where the high site-fidelity of the birds helps to evaluate trends with minimum influence of year-to-year variation between sites.
2) Monitoring is also needed in several key non-breeding areas in almost all range countries with reasonable numbers of birds regularly visiting the site. This will help with current trend evaluation.
3) Special monitoring effort should be focused on areas with ongoing habitat changes like Saemangeum in Korea. These observations may help in identifying the limiting parameters (water mineral content, mud flat composition and dynamics etc).

With the major threats identified to be on migration and in the wintering areas the main effort of the conservation activities needs to focus on these areas. However, action on the breeding grounds is still required. All monitoring activities need to be linked with AWC and IBA monitoring, but still keep the SBS survey as a separate enterprise, which requires special attention but uses and builds on the AWC network.

The coordination of counts is vital to avoid double counting (see Black faced Spoonbill).

Remote sensing and GIS based databases are vital supporting monitoring tools, which need to be further developed and regularly populated to provide additional services for the conservation activities.

h) Fund Raising

ACTION ITEM 24: Raise funding from international and national sources to support the implementation of the action plan

Acknowledgments

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References

Asian Pacific Migratory Waterbird Conservation Committee (2001): Asian Pacific Migratory Waterbird Conservation Strategy: 2001-2005). Wetlands International – Asia Pacific. Kuala Lumpur, Malaysia 67pp.

Balachandran S., 2005. Status and conservation of the shorebirds in the Central-Asian flyway. Waterbirds 2005. Avian diseases and bird migration. Proceedings of the Waterbird Society Special Meeting. Tainan, Taiwan: 34-35.

Barter et al. (2006): Maintaining shorebird populations in the East-Australasian Flyway – The Yellow Sea Challenge

Barter, M.A. 2002. Shorebirds of the Yellow Sea: Importance, Threats and Conservation Status. Wetlands International Global Series 9, International Wader Studies 12, Canberra, Australia.

BirdLife International (2001): Threatened birds of Asia: the BirdLife International Red data book. Cambirdge, UK.

BirdLife International (2003): Saving Asia' s Threatened Birds: a guide for government and civil society. Cambridge , U.K.

BirdLife International (2004): Threatened Birds of the World. Lynx & BirdLife International, Barcelona, Cambridge.

Bunting, G. & Zöckler, C. (2006): Short note on the Spoon-billed Sandpiper Database. Proceedings of the Waterbirds Around the World Conference

Courchamp F., Angulo E., Rivalan p., Hall R.J., Signoret L., et al. (2006). Rarity value and species extinction: The anthropogenic Allee effect. PloS Biol 4 (12): e415.DOL: 10.1371/journal.pbio.0040415

Crosby, M. J. and Chan, S. (2006) *Threatened waterbird species in eastern and southern Asia and actions needed for their conservation.* Waterbirds around the world.

Erftemeijer, P. L. A., and R. Jukmongkol. 1999. Migratory shorebirds and their habitats in the Inner Gulf of Thailand. Wetlands International Thailand Programme Publication 13. Wetlands International and Bird Conservation Society of Thailand, Bangkok and Hat Yai

Flint, V.E., & A. Ya.. Kondratiev (1977): An experience of evaluating of the total number of rare stenotopic species (Spoon-billed Sandpiper *Eurynorhynchus pygmeus* as an example). 7. All-Union Ornithol. Conference, Abstracts of talks 2: 250. Naukova Dumka, Kiev (In Russian).

Gore, M. E.J & P-O Won. 1971. The Birds of Korea. Published by the royal Asiatic Society, Korea Branch, in conjunction with Taewon Publishing Company, Seoul, Korea.

Grebmeier J.M., Overland J.E., Moore S.E., Farley E.V., Carmck E.C. et al. 2006. A major ecosystem shift in the Northern Bering Sea. Science. Vol. 311: 1461-1464.

Hinzman, L., N. Bettez, W.R. Bolton, F.S. Chapin III, M. Dyurgerov, C. Fastie, B. Griffith, R.D. Hollister, A. Hope, H.P. Huntington, A. Jensen, G.J. Jia, T., Jorgenson, D.L. Kane, D.R. Klein, G. Kofinas, A.H. Lynch, A.H. Lloyd, A.D.,McGuire, F. Nelson, W.C. Oechel, T.E. Osterkamp, C. Racine, V.E. Romanovsky, R. Stone, D. Stow,M. Sturm, C.E. Tweedie, G. Vourlitis, M.D. Walker, D.A. Walker, P.J. Webber, J.E. Welker, K. Winker, and K. Yoshikawa (2005) Evidence and implications of recent climate change in northern Alaska and other Arctic regions. *Climatic Change, 72*, 251–298

Carey, G.J., Chalmers, M.L., Diskin, D.A, Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yong, L. 2001. The Avifauna of Hong Kong. Hong Kong Bird Watching Society. Hong Kong.

Howes, J., & D. Parish (1989): New information on Asian Shorebirds: A preliminary review of the INTERWADER Programme 1983-1989 and priorities for the future. Asian Wetland Bureau Publ. 42 Kuala Lumpur.

Kim, T-I., Choi, B-H. & S-W Lee. 2006. Hydronamics and sedimentation induced by large-scale coastal developments in the Keum River Estuary, Korea. Estuarine Coastal and Shelf Science 68 (2006) 515-528.

Kistchinski A.A 1980. Birds of Koryak plato. Moscow. Nauka. 336 pp. (In Russian).

Kistchinski A.A. 1988. Avifauna of North-East Asia: history and modern state. Moscow, Nauka. 288 p. (In Russian)

Kretchmar A.V., A.V.Andreev & A.Ya.Kondratyev.1978.Ecology and distribution of birds at the North-East of the USSR. Nauka Publ.. Moscow: 1-196. (In Russian)

Lane, B. L. Naismith, J. Satrks, Le Dien Duc & M. Barter (1994): Shorebirds at Xuan Thuy Reserve, Red River Delta, Vietnam in March/April 1991. AWB Publ. No 103

Lethaby, N., N. Moores & Jin-Young Park (2000): Birding in South Korea. Dutch Birding 22: 204-219.

Li, Z. W. D. & Mundkur, T. 2004. *Numbers and distribution of waterbirds and wetlands in the Asia-Pacific region. Results of the Asian Waterbird Census: 1997-2001*. Wetlands International, Kuala Lumpur. 166pp.

Mahmood, A.K (2004): Banglapedia, National Encyclopedia of Bangladesh. Asiatic Society of Bangladesh. Dhaka. CD-Rom

Moores, N. 1999. A survey of the distribution and abundance of shorebirds in South Korea during 1998-1999. *Stilt* 34: 18-29.

Moores, N. 2001. Saemankeum: Internationally Significant Wetlands to be 100 % Reclaimed. *WWF Arctic Bulleti*n. No 3.01 Pp12-23.

Moores, N., Battley, P., Rogers, D., Park M-N, Sung H-C, van de Kam, J. & K. Gosbell. 2006. Birds Korea-AWSG Saemangeum Shorebird Monitoring Program Report, 2006. Published by Birds Korea.

Moores, N. 2007/in press. South Korea's Shorebirds: A Review of Abundance, Distribution, Threats and Conservation Status. *The Stilt* 50:XXX. Australasian Wader Studies Group.

Nikanorov S.I. 2006. Aquaculture. "Economica & informatika" Publ. Moscow: 216 p. (in Russian)

Round, P.D. and Gardner, D. In press. The Birds of the Bangkok Area. White Lotus, Bangkok.Ruesink and Wu, 2004 Tideflat Reclamation: A Global Comparison
http://www.apru.org/activities/afp/collab_paper.htm

Severinghaus, L. L., Brouwer, K., Chan, S., Chong, J. R., Coulter, M. C., Poorter, E. P. R. & Wang, Y. 1995. Action plan for the study of the Black-faced Spoonbill *Platalea minor*. Wild Bird Society of ROC, Tapei, Taiwan ROC. 75 pp.

Syroechkovskiy, E.E. (2003): A review of population decline of waterfowl in East Asia. Proceedings of the International Anatidae Symposium in East Asia & Siberia Region, Seosan, Korea: 48-50.

Syroechkovskiy E. (2004). The Spoon-billed Sandpiper on the edge: a review of breeding distribution, population estimates and plans for conservation research in Russia. Status and Conservation of Shorebirds in the East Asian-Australasian Flyway (Ph. Straw ed.). Proceedings of the Australasian Shorebirds Conference 13-15 December 2003, Canberra, Australia Wetlands International publication. International Wader Studies 17: 169-174.

Syroechkovskiy, E.E., Zöckler, C., (in prep.): The Importance of the Meinypilgyno area, Chukotka, Russia for the breeding of Spoon-billed Sandpiper (*Eurhynorhynchus pygmeus*)

Tomkovich P.S. & A.G.Sorokin.1983.Fauna of birds of the Eastern Chukotka. Archives of Zoological Museum of the Moscow State University. Moscow University. Moscow. V. 21:77-159. (In Russian)

Tomkovich P.S., Syroechkovski E.E.,Jr. Lappo E.G., Zöckler C. 2002. First indications of a sharp population decline in the globally threatened Spoon-billed Sandpiper, Eurynorhynchus pygmeus. Bird Conservation International, 12: 1-18.

Tomkovich, P.S. & M.Y. Soloviev (2000): Numbers of the Spoon-billed Sandpiper at the north of Kolyuchinskaya Gulf, Chukotka, and count methods for the species on breeding grounds. Russ. J. Ornithol., Express-issue 99: 3-10 (In Russian)

Tomkovich, P.S. (1992): Three-year study of breeding Spoon-billed Sandpiper. Asian Wetland News 4(2): 17.

Tomkovich, P.S. (1994): Spatial structure of the Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) population at breeding grounds. In E.N. Kurochkin (Hrsg.), Modern Ornithol. 1992: 130-148, Nauka, Moskau (In Russian)

Tomkovich, P.S. (1995): Breeding biology and breeding success of the Spoon-billed Sandpiper *Eurynorhynchus pygmeus*. Russ. J. Ornithol. 4(3/4): 77-91 (In Russian)

Tomkovich, P.S. (1998): Mating system and parental care in the Spoon-billed Sandpiper *Eurynorhynchus pygmeus*. Russ. J. Ornithol. Express-issue 31: 3-6 (in Russian).

Tomkovich, P.S. (2003): Maximum life longevity of some waders in Chukotka. In: Information materials of the working group on waders, No 16, (Eds. Tomkovich P.S., Shubin A.O.) Moscow, p.55-56. (In Russian).

Tomkovich, P.S., E.E. Syroechkovski Jr., E.G. Lappo & C. Zöckler (2002): Sharp population decline in spoon-billed sandpiper, *Eurynorhynchus pygmeus*, the globally threatened species. Bird Conserv. Internat. 12: 1-18.

Watkins, D. and co-workers (2004, in prep.): Migratory Shorebirds of the East Asian-Australasian Flyway: population estimates and important sites ???

Wetlands International (2006): Waterbird Population Estimates – 4th edition. Wetlands International, Wageningen, The Netherlands. 239p.

WRI et al. (2005):*World Resources 2005: The Wealth of the Poor-Managing Ecosystems to Fight Poverty*. World Resources Institute, United Nations Development Programme, United Nations Environment Programme and World Bank.

Zöckler, C. (2003): Neues vom Löffelstrandläufer *Eurynorhynchus pygmeus* und seinem alarmierenden Bestandsrückgang. *Limicola* 17; 188-203.

Zöckler, C., S. Balachandran, G.C. Bunting, M. Fanck, M. Kashiwagi, E.G. Lappo, G. Maheswaran, A. Sharma, E.E. Syroechkovski & K. Webb (2005): The Indian Sunderbans: an important wintering site for Siberian waders. WSG Bull.108: 42–46.

Zöckler, C., Syroechkovski, E.E., Jr., Lappo, E.G. & Bunting, G. (2006): Stable isotope analysis to determine the wintering areas of the declining Spoon-billed Sandpiper *Eurynorhynchus pygmeus* in the East Asia-Pacific Flyway. Proceedings of the Waterbirds Around the World Conference.

Zöckler, C. & Syroechkovski, E.E (in prep.): Is the Spoon-billed Sandpiper critically endangered globally? (subm. to *Forktail*)

Appendices

Maps showing regional and national distribution of important sites – currently stored as separate files:

- Entire Flyway
- India
- Bangladesh
- Myanmar
- Thailand
- Vietnam
- China (including Taiwan and Hong Kong)
- Korea (DPRK and ROK)
- Japan
- Russian Federation
- Ring recoveries

Table 2: Number of ringed juveniles and controls in the Meinypilgyno breeding area, South Chukotka

Year	No. of chicks ringed	Birds re-sighted	Number of re-sighted birds displaying or nesting
2001	30	-	-
2003	88	0	0
2004	44	0	0
2005	42	4	1-2

Table 3: Trends in SBS observation during the non-breeding period between 1988 and 2007.

	Winter (Nov-Mar)**		South Migration (Aug-Oct)**	
Year	Total count*	No. of Juveniles Recorded***	Total count *	No. of Juveniles Recorded***
1988-9	258	0	1	0
1989-0	25	0	2	0
1990-1	^226	0	0	0
1991-2	5	0	7	0

1992-3	12	0	1	0
1993-4	0	0	3	0
1994-5	5	0	1	0
1995-6	16	0	3	0
1996-7	58	0	13	0
1997-8	8	0	5	0
1998-9	6	0	184	0
1999-0	7	0	200	0
2000-1	2	0	4	0
2001-2	5	0	7	0
2002-3	9	1	28	3
2003-4	29	8	21	2
2004-5	30	6	25	3
2005-6	31	0	28	14
2006-7	32	15	21	1

*Estimated total count of all sites, based on min and max. No. of birds at one site

**The distinction between southward migration (1st August to 30th October) and wintering (1st November to 1st April) was based on the time series of monthly distribution maps (Figs 17-20) created to analyse this pattern. Figures for the northward spring migration have not yet been added as they are generally too low to show any trend. To minimize the effects of any double counting, the estimated total value is the sum of all observations at different sites during the time period. Where many birds pass through a site (such as at Khok Kham in Thailand or Mai Po in Hong Kong) this will be an underestimate, but double counting of the same birds on consecutive days is avoided.

*** Information about juveniles has not always been provided and only been added where it is available; therefore this figure is a minimum count and probably an underestimate. Increasing numbers of juveniles are most likely to represent more detailed observation as a result of better optics and better collection of data.

^ Probably represent birds on migration: the flock of 221 was in north China and now considered to be doubtful as no references can be provided.

Table 5: Summary of Ringing Activities, 2000 - 2005

Year of study	Region	Adults Ringed	chicks Ringed
2000	South	8	7
2001	South	1	33

2002	North	30	29
2003	South	53	93
2004	North	1	9
	South	15	44
2005	North	13	25
	South	13	57
2006	South	3	18
Totals	North (Light Blue)	44	63
	South (Light Green)	93	251
Grand Total		**137**	**315**

Table 6: Ring recoveries from the migration and wintering period:

Locality	**Country**	**Year**	**Mon.**	**Day**	**No. in Flock**	**Observer / Reference**	**Status**
Moulevir Char	Banglad esh	1989	Jan		202	Bakewell and Howes 1989, Asian Wetland News 2, 1 [1989]: 9	Two Flagged by P Tomkovich
Mangyeung estuary	South Korea	2002	Sep	9	3	Nial Moores	4 red leg flags and a metal band*
Tokyo	Japan	2002	Sep	9	1	Minoru KASHIWAGI	Pale Blue
Mangyeung estuary	South Korea	2003	Sep	21	1	Kim Kyung-Won & KFEM	1 Juvenile, with blue leg flag, photographed
Tamashima Landfill	Japan	2004	Sep	19	1	NAKASHIMA Kenji	Pale Green
Yubu Island	South Korea	2004	Oct	1	3	Lee pers comm.	One flagged MP 2004 (Pale Green)
Ebiye Coast	Japan	2005	Sep	15	1	TATEI	Adult breeding plumage, pale green flag
Nakdong	South	2005	Sep	21	1	Jeon Shi-Jin	Juvenile, green flag on right tibia, metal on

estuary	Korea						left
Khok Kham	Thailand	2005	Nov	3	1	Suchart Daengphayon (Tee), Phil Round pers comm.	Pale Green
Pak Thale	Thailand	2006	Mar	1	2	D. Bengtsson, B. Persson and K. Svensson	Pale Blue (one)
Nanan, near Xiamen	China	2006	Apr	16	1	Mr Dong Guotai	One colour ringed bird Yellow over Blue Left leg
Minjiang Estuary	China	2006	Apr	15	6	Ms Chen Zhigong of Xiamen Bird Watching Society	
?	Japan	2006	Sep			?	Metal ring only
Geum	Korea	2006	Sep	25	15	Danny Rogers	Light green flag on left leg

* unclear origin of rings

ANNEX 3

Action Plan for the Conservation of Chinese Crested Tern (*Thalasseus bernsteini*)

First consultation draft

February 2007

Table of Contents

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Executive Summary

（To be written when the draft is finalized）

I. Introduction

The Chinese Crested Tern has long been one of the ornithological enigmas in eastern Asia. After twenty-one birds were collected on Muguan Dao[1], a group of islands near Qingdao, Shandong Province of eastern China in June and July 1937, it had all but disappeared apart from a few, mostly unconfirmed records from China, Thailand and Indonesia. It is thought to be at the verge of extinction, and even feared extinct, until breeding birds were found on Mazu[2] Islands, on the coast of Fujian Province, eastern China in June 2000. Subsequently another breeding population was found in the coast of Zhejiang Province of eastern China. Post-breeding Chinese Crested Terns have been recorded recently in Fujian and Shanghai from June to September. Birds apparently on passage migration were recorded in southern Taiwan (Bazhang[3] River Estuary on 17 April 1998 and 21 October 2000). Three birds were reported at the Xisha Archipelago[4] in the South China Sea in April 2004. This species probably winters on islands in the South China Sea.

The rediscovery of this species is good news but their survival is found to be under very severe pressure. The total population is very small, probably not more than 50 birds, and they are under very heavy exploitation of egg collection by fishermen from eastern China. Apart from removing eggs of Chinese Crested Tern it also caused considerable disturbance, this has probably resulted in the breeding birds (at least the Zhejiang population) do not nest on the same site every year. Until recent years Mazu had been safe from disturbance due to militarily tension across the Taiwanese Strait. In recent years this tension reduced, mainland fishermen at times come and collect eggs on some of the islands and this has become an increasing threat to terns breeding in Mazu.

After the compilation of the Threatened Birds of Asia: BirdLife International Red Data Book (2001), which highlights the Chinese Crested Tern as one of the species at highest risk of extinction in Asia, this species was added to a appendix of the Convention for Migratory Species (CMS) in 2002. BirdLife was invited to draft a conservation action plan for the Chinese Crested Tern under the auspice of the CMS.

Almost all recent records of the Chinese Crested Terns are from China (both mainland and Taiwan), therefore a small meeting was organized in Hangzhou in May 2006 and invited specialists from both sides of the Taiwanese Strait to discuss drafting of the action plan. Professor Yuen Hsiao-wei of National Taiwan University, Dr. Chen Shuihua of Zhejiang Natural History Museum and Simba Chan of BirdLife International Asia Division discussed issues on conservation of this critically endangered species. Additional information was received from birdwatching societies of Fujian Province.

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1 Also transliterated as Mukuantao

2 Also transliterated as Matsu or Matzu

3 Also transliterated as Pachang or Pachang Hsi (Hsi = River)

4 Also known as the Paracel Islands. Xisha is the Chinese name of the islands. The islands are also known as Hoang Sa Islands in Vietnam, which also claim her sovereignty over the islands.

The editors feel grateful to the help from Dr. Cao Lei (University of Science and Technology of China), Mr Chang Shou-hua (Wild Bird Society of Mazu), Mr. Jiang Hangdong (Xiamen Birdwatching Society), Mr. Yang Jin (Fujian Birdwatching Society), Mr. Victor Yu (Wild Bird Federation Taiwan) and Ms Zheng Huaizhou (Fujian Normal University) for their contribution of data and conservation recommendations. The draft had been read and commented by xxxxxxxx. ….We would like to express our gratitude to their useful input on what actions should be taken to this almost unknown species.

It seems Chinese Crested Tern is running out of time, if conservation actions are not done immediately, we may lose this species again in just a few years. It is important that government agencies at all levels across the Taiwanese Strait to establish a channel of communication and coordination. At this stage it is probably best done through NGOs and academic institutions. Eventually the best scenario is both sides of the Taiwanese Strait work together on conservation of this species.

II. Distribution:

All known records of Chinese Crested Terns are confined to eastern Asia. With a few exceptional records (mostly unconfirmed) from Thailand, the Philippines, Malaysia (Sarawak), Indonesia, Cambodia and Singapore, all records were from Chinese waters. Historic breeding site located on the southern side of the Shandong Peninsula, while all recent known breeding records are from the coast of Fujian and Zhejiang, just south of the Yangtze Estuary. A recent (2006) survey in the islands of Shandong has not revealed signs of breeding on islands surveyed.

Post-breeding birds are recorded at Beidaihe in Hebei (June 1978), Yellow River Delta in Shandong (September 1991), Chongming Dongtan in Shanghai (September 2004), Min Jiang Estuary, Fujian (August 2004, June – August 2005), and Bachang River Estuary in Chiayi, Taiwan (April 1998 and October 2000). One recent record of three birds in Xisha Archipelago in the South China Sea in April 2004 suggests that the Chinese Crested Tern winter on islands in the South China Sea. It has not been recorded from Guangdong, Hainan nor Vietnam but may occur.

III. Status

① International threatened status

The Chinese Crested Tern was listed as "Indeterminate" in the first International Red Data Book of birds (King 1981) as there was not enough data to evaluate its status. The ICBP[5] Birds to Watch: World Checklist of Threatened Birds (Collar and Andrew 1988) listed it as a threatened species. It was regarded as Critically Endangered in the revised edition of Birds to Watch II six years later (Collar and Stratsfield 1994) because of its extremely low global population. This category remained unchanged on the BirdLife International on compilation of Red Data Book of Threatened Birds of Asia (2001) and to the date of publication of this Action Plan.

② Protection status

1. International

a. Convention of Migratory Species (CMS):

The Chinese Crested Tern has been listed in the CMS Appendix I of the Convention of Migratory Species since 2002. It means the status of being in danger of extinction is recognized by the CMS and CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Besides establishing obligations for each State joining the Convention, CMS promotes concerted action among the Range States of many of these species.

b. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

It is not listed on the CITES appendices.

c. The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention):

Apart from Chongming Dongtan, where only one bird was seen briefly on 5 September 2004, all sites that the Chinese Crested Tern has been recorded are not designated as Ramsar Sites.

2. National and local legislation

a. China

i. Mainland

Listed as a Nationally Protected Species (Second Class) since 1989. A county-level waterbird protected area of 2,921 ha was established at the Min Jiang Estuary in 2003. A

[5] International Council for Bird Preservation, the name of BirdLife International prior to 1994

protected area on marine ecosystem of 114,950 ha was established at Jiushan Islands of Zhejiang in 2003.

ii. Taiwan

The Chinese Crested Tern is not listed as a Protected Species in Taiwan. However, the breeding site is located in the Mazu Islands Tern Protected Area established on 26 January 2000. Landing on the islands are prohibited. The islands are patrolled by guards with supports from the Wild Bird Society of Mazu at breeding season.

b. Philippines

Birds listed on the IUCN threatened list are protected in the Philippines and Chinese Crested Tern is no exception.

c. Thailand

Protected in Thailand as all bird except 60 species are protected in Thailand.

(Vietnam, Malaysia and Indonesia?)

IV. Threat analysis

① Habitat loss

The islands where the Chinese Crested Tern breeds are small uninhabited islands. There is no imminent development pressure to these breeding sites. However, the disappearance of breeding colonies in northern China may be the result of human settlement and development on the islands in Shandong. Coastal wetlands where the Chinese Crested Tern visits after breeding season are under heavy development pressure as coastal southeastern China is the region of fastest economic development in China. Coastal wetlands are reclaimed to become farmland, aquacultural pond or industrial estates. Although a county-level protected area has been established at the Min Jiang Estuary, demand of land for industry and housing estates is very high and reclamation is still severe at this important site for the Chinese Crested Tern.

② Habitat degradation and pollution

The booming industry and population in southeastern China results in a high level of pollution, both as domestic sewage and industrial effluent. According to a survey conducted by the Department of Oceanography and Fishery of Zhejiang Province in 2005, 64% of the coastal water in Zhejiang is moderately or seriously polluted. Monitoring results from benthos such as mussels revealed high level of agrochemical and heavy metal. Situation at

the estuaries is even worse. Peak of red tide in Zhejiang is May to June, large amount of fish are killed and food availability to the breeding Chinese Crested Tern is reduced. At the Min Jiang Estuary, Fujian, Sewage from nearby Changle City is directly discharged into the estuary. Landscape of the Mini Jiang Estuary has also deteriorated as a result of various human activities and encroachment.

③ Exploitation

This is the biggest threat to this Critically Endangered species. At both breeding grounds (Mazu Islands in Fujian and Jiushan Islands in Zhejiang), collection of seabird eggs are reported to be serious. Seabird eggs are collected by local fishermen, who believe wild eggs have better nutritious value than poultry eggs. Collection of eggs forces Chinese Crested Terns to switch their breeding sites in every other year in the waters of Zhejiang. At Mazu, until recent years the surrounding waters had been restricted zone due to the military tension between Beijing and Taipei. This has changed as economic tie grows. Fishermen from nearby Fujian villages frequently come to Mazu to collect seabird eggs, exploiting the situation that the soldiers at Mazu would not want to risk the political trouble of detaining mainland fishermen.

④ Disturbance

Most serious disturbance is from landing of fishermen to breeding islands for egg collecting. Other fishery activities at or near the breeding grounds, such as shellfish collection, would also deter breeding birds from their feeding grounds. At Mazu, tourism is another source of disturbance. As tourism and leisure photography in mainland is also on the increase, it will become a problem to the breeding ground in Zhejiang. Hainan Province is reported to have plans to develop Xisha into a tourist destination. That might cause more disturbances to the Chinese Crested Tern that migrates or winters on these islands.

⑤ Predators

So far there has been no study on the predators to the Chinese Crested Tern colony. If the islands are infested with rats or feral cats it would be a negative factor to the breeding success.

⑥ Overfishing

Although China has announcement laws on restriction of fisheries at certain time of the year to conserve fish stock, illegal fishing still exist. Overfishing will reduce the food source of the Chinese Crested Tern

⑦ Natural Disaster

Strong typhoons pass Fujian and Zhejiang in summer. In August 2004 two big typhoons devastated the tern colonies on Jiushan Islands.

V. Conservation actions recommended

① Short-term objectives (within five years after publication of this action plan)

Acronyms of organizations

BLA	BirdLife International Asia Division	NBBC	National Bird Banding Center, China
COA	Council of Agriculture (Taiwan)	NTU	National Taiwan University
COS	China Ornithological Society	SFA	State Forestry Administration, China
DENR	Department of Environment and Natural Resources, the Philippines	WBFT	Wild Bird Federation Taiwan
FJBWS	Fujian Bird watching Society	WBSJ	Wild Bird Society of Japan
KFEM	Korean Federation of Environmental Movement	XMBWS	Xiamen Bird Watching Society
KNIER	National Institute of Environmental Research, Republic of Korea	ZJWBS	Zhejiang Wildbird Society
MONRE	Ministry of Natural Resources and Natural Environment, Vietnam	ZMNH	Zhejiang Museum of Natural History

1. Legal status

As the existence of Chinese Crested Tern had not been positively proven until 2000, it had long been ignored or considered to be a species that no longer existed, so it would not be a surprise to find despite its rarity it has never been treated as a high conservation priority. However, since the rediscovery it is found that exploitation of egg collection is the biggest threat to this species, urgent measures to stop this need to be implemented without delay. The conservation measure and enforcement will be strengthened when the Chinese Crested Tern is listed at the highest protection level. Laws and regulations should be imposed to plug all possible loopholes, including the possibility of international trade to zoos or collectors.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Strength protection status	Listing it at the First Class of Protected Species in China (Mainland)	SFA	Listing the Chinese Crested Tern at the highest protection level when the Protected Species List is revised		Moderate
	Appropriate protection status drafted by the Fishery Administration in China	Fishery agencies in China, SFA, local forestry and relevant government agencies in Fujian and Zhejiang	Holding a meeting to draft relevant regulations on fishery, particularly for Fujian and Zhejiang. Regulations may include a stricter control of fishing near the known breeding colonies of Chinese Crested Terns and how to compensate the loss of the fishing community.	Local governments and organizations to promote the regulation. Make sure all fishery communities understand what those regulations are for	High
	Taiwan: Listing it as a protected species	Relevant government agencies.	Relevant government agencies: Officially list Chinese Crested Tern as a protected species		Moderate
	Vietnam: Listing it as a protected species	MONRE	Listing Chinese Crested Tern as a protected species		Moderate
Stop exploitation	Laws on prohibition of seabird egg collection must be enforced all over coastal eastern China	SFA, local government in Fujian and Zhejiang, COS, NBBC, birdwatching societies in Xiamen, Fujian, Zhejiang and Shanghai, Wild Bird Society of Mazu, BLA and partners	SFA and local government: Enforce the law to prohibit seabird egg collection. COS, NBBC, birdwatching societies in China: Promote the law especially to fishery communities. WBFT, WBS Mazu: Coordination of information on egg collection at Mazu BLA and partners: Assisting in communication and information	All: Produce printed material, broadcasting programme, tevevision programme etc. to promote the regulation. Keep vigilance at all breeding grounds	High
	Selling and consuming seabird eggs should be banned in eastern China	SFA, local government in Fujian and Zhejiang, COS, NBBC, birdwatching societies in Xiamen, Fujian, Zhejiang and Shanghai	SFA and local government: consider a ban on selling and consumption of seabird eggs in eastern China. This will contribute not just to the conservation of the Chinese Crested Tern but also the Black-faced Spoonbill and Chinese Egret	COS, NBBC, birdwatching societies in China: Promote the law by the mass media and public events	High
Prevent possible international trade	Listing the species to CITES	SFA, DENR	Propose listing this species to the CITES appendix to stop possible trade.		Moderate

2. Understanding the distribution and population

Virtually we do not know much about the distribution of the Chinese Crested Tern except the two breeding sites and a few recent post-breeding records. Wintering ground of the Chinese Crested Tern has never been reported, but it seems likely to be in the South China Sea. Thorough surveys should be conducted in the islands of Shandong, where breeding colonies were known until 1930s. Records in late 20th century in Hebei and Shandong suggests the possibility of breeding birds still exist in Shandong. Xisha Island should be thoroughly studied as Dr. Cao of University of Science and Technology of China found three birds briefly at Xishazhou on 4 April 2004 (the survey period was March to April 2003 and April to August 2004) The fact that the Chinese Crested Terns were only found in early April but not rest of the survey suggested they were not likely to occur in summer. Promotion material to ask for colonies or flocks of Crested Tern species should be made available to fishery communities not only in China but also Vietnam, the Philippines, Malaysia (particularly eastern Malaysia) and Indonesia in searching for the wintering and staging ground of the Chinese Crested Tern

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Searching for breeding colonies	Detailed survey on islands in Shandong, Zhejiang and Fujian	SFA. NBBC, research institutions, birdwatching societies (Fujian, Xiamen, Zhejiang etc), BLA	SFA: Financial and legal support to the survey BLA and partners: Financial support and international coordination NBBC, BLA and partners: Provide training to the surveyors. NBBC, research institutions: Design and coordinate the survey. Local forestry bureaus and birdwatching societies: Conduct surveys	NBBC, Research Institute Data analysis and legal protection measures SFA and relevant agencies: Establishment of nature reserve	High
Migration study	A meeting to develop a safe method of marking and studying migration of the Chinese Crested Tern	National governments, Banding schemes and international experts on terns	All: Discussion on useful marking methods or other technique to study the migration.	Design a test it on other crested terns for improvement of technique	Low
Survey for migration and	Survey Xisha Island for migration/ wintering birds	SFA, NBBC, COS	SFA: Financial and legal support NBBC, COS: Conduct the survey		High

wintering sites	Survey the islands in South China Sea for wintering sites	Government agencies in China mainland, Taiwan, Vietnam, Philippines, Malaysia, Brunei, Indonesia, BLA and partners	Government agencies around South China Sea: Provide financial and legal support to the survey. BLA and partners: Coordinate and conduct the survey		Moderate to Low

3 Establishment and safeguarding important sites

Of the important sites to the Chinese Crested Tern, only Mazu is properly protected. At the other two sites that area known to be important to the Chinese Crested Tern: Jiushan Island and Min Jiang Estuary, only lower administrative level protected areas were established and almost no resources to the management. The importance of these two sites must be addressed with more resources to better management, particularly to Jiushan Islands and any breeding grounds discovered in future. Egg collection and disturbance to the tern colonies should be strictly prohibited.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Establishment of protected area	Upgrade the status of protected area in Jiushan Islands	Relevant government agency, ZNHM	Propose the protected area be upgraded to national level.	Ensure good staffing and facilities for patrolling	High
	Upgrade the status of protected area at the Min Jiang Estuary	SFA, Fujian Forestry Bureau	Propose the protected area be upgraded to national level.	Site land use management plan for the Min Jiang Estuary	High
	Protected area to be establish when new breeding colonies or wintering site are found	Relevant government agencies in all potential range countries	Designation of protection area	Management planning for the new protected areas	High
Enforce ban on landing the breeding islands	The ban made known to fishing communities	Relevant government agencies			High
	Sign boards should be put on the islands	Relevant government agencies			Low
	Guard post should be established near the island with regular patrol	Relevant government agencies			High

4. Promotion and education

Although the Chinese Crested Tern is one of the most threatened species in Asia, it is largely unknown to the public because it has not been recorded for many decades. Promotion on the status of the Chinese Crested Tern to the general public, particularly areas where it occur or could occur, is in urgent need. It can be used as a flagship species for conservation of sub-tropical seabirds in eastern Asia.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Production of painted materials	Promotion material (e.g. poster and leaflet) produced mainly targeting at China fishery communities for information and prevent exploitation and disturbance to breeding colonies.	COS, BLA and partners, birdwatching societies in China	BLA: Identify funding sources COS, BLA and partners: Organizing workshop on what materials to be produced Birdwatching societies: Production and distribution of materials		High
	Posters and leaflet of information for potential wintering countries, particularly Vietnam, the Philippines, Malaysia and Indonesia	BLA and partners	Fundraising and produce material on the importance the Chinese Crested Tern and asking for information. In national languages.	A focal person at each organization to collect and disseminate information on Chinese Crested Terns	Moderate
Education Programme	Education programme made to promote concept of conservation of the Chinese Crested Tern to the fishery communities in Fujian and Zhejiang	SFA, COA, BLA, birdwatching societies	SFA and forestry bureaus: Legal support and guidance. COA, BLA: Organizing workshop on programme design and training of educators Birdwatching societies: Conducting education programme at the fishery communities	A workshop to evaluate the effectiveness held two years after the programme started.	High

5. Biological studies on the Chinese Crested Tern

Almost nothing is known on the biology of the Chinese Crested Tern. This makes designing conservation measures to this species rather difficult as its behaviour and needs could on be assumed to be similar to other crested terns. Good biological study on the behaviour of this species, particularly factors that might be contributing to its rarity, is urgently needed. At the first stage the researchers should seek for advice of experts on other crested tern species to design their study programme. The population is very small and fragile that all efforts must be take not to affect the survival of this species at the studies.

Workers of Jiushan Island Nature Reserve found that after removal of fish nets in the nature reserve, number of terns decreased. It has been suggested some

limited fishing activities may be beneficial to terns as it helps them to find food. The relationship is worth studying. At the same time the risk of fishnets to terns must also be evaluated.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Study the breeding biology of the Chinese Crested Tern	Collect baseline information on breeding biology of the Chinese Crested Tern in Zhejiang and Fujian, including nesting, food, foraging sites, clutch size etc.	SFA, NBBC, COS, BLA and partners, other research institutes, birdwatching societies	SFA: Provide legal supports NBBC, COS: Design study programme BLA and partners: International advice on study programme NBBC, COS, research institutes and birdwatching societies: collecting information in the field.	Workshops should be held to exchange information and experience with the Taiwanese counterpart regularly	High
	Conducting breeding biology study of the Chinese Crested Tern at Mazu	COA, NTU, BLA and partners, Wild Bird Society of Mazu	COA: Legal and financial support NTU and other institutes: Design study programme BLA and partners: International advice on study programme NTU, research institutes, Wild b¥Bird Society of Mazu: collecting information in the field.	Workshops should be held to exchange information and experience with the mainalnd counterpart regularly	High
Study the feeding behaviour of terns near breeding ciolonies	Study the relationship between fish nets and foraging success of terns (including other crested tern species) at the potential breeding ground of Chinese Crested Terns	SFA, COA, Research institutes in Zhejiang, Fujian and Taiwna	SFA, COA: Legal and financial support Research institutes : conduct study on the effects of fish nets to tern species (particularly crested terns)	Evaluate whether there are relationship on foraging success and fish nets. Also evaluate the risk of fish nets to the terns	High

6. Coordination on conservation and information exchange

Researchers from China mainland and Taiwan should establish an official channel of communication on conservation issues. This should be expanded to include other countries when wintering ground is found in that country. As the islands in the South China Sea is claimed by many countries, each country should consult with its Foreign Affairs Department for the advice on cooperation but not raising unnecessary political issues.

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Unofficial communication channels between mainland and Taiwan	Establish the informal channels by regular meeting and focal points at both sides of the Taiwanese Strait	Relevant government agencies and organizations			High

② Long-term objectives (beyond 2010)

1. Monitoring of Chinese Crested Tern and the habitats

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Monitoring number of the Chinese Crested Tern	Breeding bird survey/census	NBBC, local forestry bureaus, birdwatching societies in China, WBFT, Wild Bird Society of Mazu	Agree on what data are to be collected during the census. Draft a standardized census form for the database of the Chinese Crested Tern. Coordination of breeding bird census at all known sites. A coordinated dissemination of information	Keep a database of numbers and location of nests at the breeding site every year.	High
	Keep records of Chinese Crested Terns at all possible post-breeding sites, particularly the Min Jiang Estuary	NBBC, local forestry bureaus, birdwatching societies in China	Collecting all reliable information	Keep all records at the database	Moderate

Habitat monitoring	Monitor the environmental factor such as water quality and land use changes at sites frequently used by the Chinese Crested Tern at the Min Jiang Estuary	Local forestry bureaus, birdwatching societies in Fujian	Agree on what data are to be collected and draft a monitoring plan for Min Jiang Estuary. The monitoring should also cover habitats important to other globally threatened waterbirds such as Black-faced Spoonbills, Saunders's Gulls, Swan Geese and Dalmatian Pelicans at the Min Jiang Estuary. Annual report on the monitoring should be made available to government agencies and relevant conservation organizations	Report on the monitoring should contribute to the land management of the Min Jiang Estuary	High
Database and storage system	Develop a central database and information center of Chinese Crested Tern. It can be expanded to be a seabird database for tropic and sub-tropical western Pacific	NBBC, COS, COA, BLA and partners	Discussion how to establish a regional database center for the Chinese Crested Tern		Moderate

2. Education and public awareness

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Education programme for important sites	Develop education programme, particularly for schools, using the Chinese Crested Tern as a flagship of seabird conservation	BLA and partners, COS, birdwatching societies in China and Wild Bird Society of Mazu			High
Establish an education resource center	Discussion on developing am education resource center for seabird/waterbird conservation in China mainland and/or Taiwan	BLA and partners, other conservation and education organizations in China mainland and Taiwan			Moderate

3. Establish a long-term cooperative mechanism

Program	Activity	Responsible organization	Implementation progress	Further specific actions to undertake	Priority
Twining important sites of Chinese Crested Terns	Taiwan, Fujian and Zhejiang should establish a close communication system. Mazu and Jiushan should be twinned protected areas with regular cross-visit to study the management of breeding areas. International experts on seabird/tern conservation should participate in design of management at the beginning stage	SFA, COA, COS, local organizations and birdwatching/wild bird societies in mainland and Taiwan, BLA and partners	Start discussion on how to establish informal links between important sites and organizations involved in Chinese Crested Tern conservation. This should include regular information exchange, site management, research and coordination in law enforcement.		High
Regular meeting and exchange of information	Organizations from China mainland and Taiwan, and other Asian countries when important wintering areas for Chinese Crested Terns are found, should hold regular meetings on information exchange and joint actions on conservation of the Chinese Crested Tern	SFA, COA, COS, local organizations and birdwatching/wild bird societies in mainland and Taiwan, BLA and partners			Moderate

Appendix 1 Important sites to the Chinese Crested Tern

Jiushan Islands, Xiangshan County, Zhejiang Province

Location: 29deg20'30"- 29deg28'36"N 122deg0'18"-122deg15'24"E
Area: 730ha in total.
Simple description of the site: A group of 28 islands and 48 atolls in the East China Sea. The nearest point is mainland is about 18.5 km. The island where breeding birds were found in 2004 is a small uninhabited island of 1.5 ha. Main vegetation on the island is bush and grasses in the central concaved area. The higher sides of the island (northwestern and southern side) are mostly bare soil or rocks. Tern colonies are mainly found in these exposed area or area with dried vegetation.
Number estimated: About 10-20 Chinese Crested Terns in the whole area. Zhejiang Natural History Museum surveyed the 1.5 ha island mentioned above from 28 July to 2 August 2004. At this survey a total of 1760 eggs were found. Most (95%) of the tern nests had only one egg, a few had two and only 3 or 4 nests had 3 eggs. Eggs were not hatched during the survey..
Wetland type: Island and seacoast
Land ownership and land use: State owned and uninhabited
Contacts of management authority/authorities: Zhejjiang Jiushan Archipelago Oceanic Ecosystem Provincial Nature Reserves Administration
Threats: Egg collection, overfishing and other human disturbance
Conservation measures taken: Zhejjiang Jiushan Archipelago Oceanic Ecosystem Provincial Nature Reserve (Province level) was established in 2003.
Contacts of local researcher/conservation organizations: Dr. Chen Shuihua, Zhejiang Museum of Natural History

Min Jiang Estuary, Changle City, Fujian Province

Location: app. 26deg01'N 119deg38'E
Area: app. 3000 ha
Simple description of the site:
Number estimation: Three Chinese Crested Terns were found by Mr. Liu Bofeng (Fujian Wildlife Monitoring Center) and Mr. Yu Xi (Fujian Province Forestry Survey and Planning Institute) on 31 July 2004. Two birds were seen in 2005 and three birds on 16 July 2006.
Wetland type: River mouth estuary
Land ownership and land use: State owned? Farmland and urban use?
Contacts of management authority/authorities: Fuijan Forestry Bureau
Threats: Reclamation and unplanned development. Jinfeng Town that is adjacent to the Min Jiang Estuary has heavy textile industry and expanding. Pollution of water effluent from Changle City.
Conservation measures taken:
Contacts of local researcher/conservation organizations: Fujian Bird watching Society?

Mazu Islands Tern Nature Reserve, Lianjiang County, Fujian Province[6]

Location: 26deg13'N 120deg02'E
Area: 71.6ha (land area 11.9 ha)
Simple description of the site: Eight small barren islands with sparse vegetation. It is located at the convergence of warm and cold sea currents and gifted with rich fish resources. The area was 'protected' as military restricted area until recent tears. Thousands of terns breed on these islands. It was during one of the regular patrol to these islands that the breeding Chinese Crested Terns were found.
Wetland type: Island and sea coast
Land ownership and land use: State owned? No human settlement and it is now a nature reserve (established in January 2000). The only economic activities are fishery and tourism?
Contacts of management authority/authorities: Lianjiang county government?
Threats: Used to be an army shooting practice ground. The biggest threat now is illegal egg collection and fisheries from other places in Fujian.

[6] Under the administration of Taipei

Conservation measures taken: Nature reserve established in January 2000.
Contacts of local researcher/conservation organizations: Wild Bird Society of Mazu

Appendix 2: Records of the Chinese Crested Tern

Number of Chinese Crested Tern observed on Mazu Island

Year	Adult	Nestling
2000	Four pairs	Four birds
2001	One bird	None
2002	Three pairs	Two birds
2003	Two birds	None
2004	Six pairs	3 birds
2005	Two pairs	None

(From Mr. Chang Shou-hua, Chairman of Wild Bird Society of Mazu)

References

BirdLife International (2001) Threatened Birds of Asia: the BirdLife international Red Data Book. BirdLife International, Cambridge, U.K.

Cao L., Pang Y.L. and Liu N.F (unpublished?) Seabirds and other birds of the Xisha Archipelago, South China Sea.

Chen Shuihua, Yan Chong-wei, Fan Zhongyong, Chen Cangsong, Zhang Fanggang (2005) The Breeding Colony of Chinese Crested Tern at Jiushan Archipelago in Zhejiang. Chinese Journal of Zoology 40(1): 96-97 (in Chinese)

Liang, C.T., Chang S.H. and Fang W.H. (2000) Discovery of a breeding colony of Chinese Crested Terns. Oriental Bird Club Bull. 32:1819

Zhang Kejia, Yu Xi, Gan Xiaojing, Melville, D.S. (2004) Chinese Crested Tern at Chongming Dao, Shanghai, China. BirdingAsia.