

**Designation date: 11/01/2002      Ramsar Site no. 1147**

# **Information Sheet on Ramsar Wetlands (RIS) 2006-2008 version**

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

## **Notes for compilers:**

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

FOR OFFICE USE ONLY.

DD MM YY

Designation date Site Reference Number

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

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## **2. Date this sheet was completed/updated:**

October 10, 2007

### 3. Country:

The People's Republic of China

### 4. Name of the Ramsar site:

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

Da Lian National Spotted Seal (*Phoca vitulina*) Nature Reserve

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

This RIS is for (tick one box only):

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

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

#### a) Site boundary and area

**The Ramsar site boundary and site area are unchanged:**

or

#### If the site boundary has changed:

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

and/or

#### If the site area has changed:

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

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

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

Due to the climate warming, except in some exceptional years, the sea ice area of Liaodong Bay tends to decrease generally. The number of spotted seal individuals has restored from 1 000 in 2000 to more than 2 000 in 2007. The criterions applied remain unchanged.

### 7. Map of site:

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

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

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

**b) Describe briefly the type of boundary delineation applied:**

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

The boundary of this Ramsar site follows the coastline, and it is located within the national reserve.

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

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

Extent: 38°55'-39°20'N, 121°00'-121°40'E.

Center: 39°15'N, 121°15'E.

**9. General location:**

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

The site is located along the coast of the Liaodong Bay in the Bohai, Dalian city, Liaoning Province, PR China.

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

0-328.7 m

**11. Area: (in hectares)**

11 700 ha

**12. General overview of the site:**

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

The national nature reserve is located in the Dalian city, Liaoning Province, northeast China. It mainly protects wild animals. Spotted seal is the only pinnipedia marine mammal species of China that could breed on ice sheets. As the second class national protected species, spotted seals' sole propagation place in China is the floating ice sheets in Liaodong Bay.

The Liaodong Bay lies in the extreme north of the tide belt of China. There are around 100 species of fishes, 3 species of shrimps, 2 species of crabs, 3 species of cephalopods and 9 species of marine animals (including *Phoca largha*, *Balaenoptera acutorostrata*, *Orcinus orca*, *Pseudorca crassidens*, *Pseudorca crassidens*, *Delphinus delphis*, *Neophocaena phocaenoides*, etc). There are

totally 52 animal species inhabiting in Liaodong Bay. Biological communities vary in tidal zone due to diverse environments. Mollusca are overwhelming predominant, ranking by species number. The *Crassostrea giga* distributed in the east Liaodong Bay and the *Scapharca broughtonii* in the south. *Acetes Chinensis* and *Jellyfish* are the two major planktons in the Bay.

### 13. Ramsar Criteria:

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

1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4	5	6	7	8	9
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### 14. Justification for the application of each Criterion listed in 13 above:

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

#### Criterion 2:

According to the list of China key protected wildlife, 9 species are under national second class protection including 2 species of pinniped animals and 7 whale species. Nine species recorded in the Annex II of CITES are listed below:

Species Latin name	Listed in CITES
<i>Phoca largha</i>	<input type="checkbox"/>
<i>Eumetopias jubatus</i>	<input type="checkbox"/>
<i>Balaenoptera physalus</i>	<input type="checkbox"/>
<i>Balaenoptera acutorostrata</i>	<input type="checkbox"/>
<i>Orcinus orca</i>	<input type="checkbox"/>
<i>Delphinus delphis</i>	<input type="checkbox"/>
<i>Pseudorca crassidens</i>	<input type="checkbox"/>
<i>Pseudorca crassidens</i>	<input type="checkbox"/>
<i>Neophocaena phocaenoides</i>	<input type="checkbox"/>

#### Criterion 3:

Liaodong Bay is a traditional fishery region which has rich marine biological resources. There are approximately more than 100 species of oceanic fishes, 5 species of economic crustaceans, 3 species of Cephalopods and 10 species of Shellfishes. Also, there are 9 species of marine mammals under the national second class protection. Whale species mainly include fin whale, minke whale, killer whales, false killer whale, common dolphins, bottlenose dolphins and finless porpoise; pinnipedia species include spotted seals and north sea lions. Liaodong Bay is a main inhabiting and breeding place for spotted seals in China.

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

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

**a) biogeographic region:**

Huanghuai Plain Subregion-North China region, Northeast Sub Realm, Palaearctic Realm

**b) biogeographic regionalisation scheme (include reference citation):**

Zoogeography of China, Zhang Rongzu, 1999.

**16. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

**Geology and geomorphology:**

Spotted seal nature reserve lies in the southeast of Liaodong Bay where the bottom of the sea mainly consists of bedrock and has a large steep slope with a water depth of 20-40 m. There are many islands, more than 70 coral reefs in the site. The coastline has a length of 147.5 km.

Much of sediments are terrigenous clastic substance in the seafloor of Liaodong Bay. In the north of the bay, Liao river, Shuangtaizi river, Daling river and Xiaoling river merge into the sea carrying tons of grains with tiny particles which is smaller close to shore and bigger in the south far from the beach. Surface deposits in the granules are Mud-silty Clay and Clayey mud. In the vicinity of the Changxing Island which lies in the east of the Bay presents variety of gravels with different particle sizes. Sandy sediment distributes in the south.

**Climate:**

(1) Temperature: Liaodong Bay is located at the latitude between 39° and 41°N in the north of Bohai, considered as a marine area with the highest latitude in China. Air temperature decreases from ocean to continent with the coastal area being the transition zone. The annual extreme high temperature is higher in the west coast, reaching up to 40°C while other places scatter between 34-36°C (islands reach to 33°C). The annual extreme low temperature is -27--29°C. The average annual temperature is 9.3°C in the oceanic area.

(2) Monsoon: In May, the spring prevailing wind over Liaodong Bay turns into south wind. Summer prevailing winds include south by southwest wind and west by southwest wind. Fall is a transition period for wind from summer monsoon to winter monsoon. Wind over the Liaodong Bay turns to north in September, with a relatively high wind speed. The wind speed peaks in November. The average wind speed is 6.2-7.6 m/s. North wind is prevailing in winter and the probability of north by northeast wind at Changxing Island can reach to 24% in January.

(3) Rainfall: Rainfall along the Bohai coast varies between 474 and 684 mm. Liaodong Bay is rich in rainfall over 610 mm throughout a year. In Yingkou, the rainfall amount is more than 600 mm while in Qinhuangdao the number could approximately reach its highest level of 684 mm. The average rainfall in the marine area varies from 580 to 750 mm, with a total solar radiation of 143.3 kcal/cm<sup>2</sup>.

**Hydrology:**

In spring, it comes to the warming stage in March and April, and the horizontal distribution of the water temperature is as follow: in the northern estuary region close to the shore, surface water temperature is more than 15℃. Isotherms around the east and west bank are nearly parallel with the coastlines, the highest temperature in east bank reaches more than 15℃ while in west bank the number is more than 18℃. Ranges of the water temperature change in the two opposite banks are 10~15℃ and 12~18℃, respectively. The bottom temperature is lower than the surface by 1~2℃. In summer the water temperature reaches the peak value in a year, with the water temperature near shore apparently higher than offshore. Distribution of salinity in the marine area of the reserve is on the low side in winter and spring, ranging from 30.2 to 32.8. In Liaodong Bay, the mixing tidal type of non-regular and semidiurnal tide is presented from Yangtouwua in the south to Tuanshanjiao in the west bank; while regular diurnal tide is shown in the coastal regions between Xinlitun and Qinhuangdao.

#### **Sea ice:**

In Bohai, Liaodong Bay has the longest ice period and the most heavy ice accumulation. In common years, the initial date of ice is in middle or late November, latest in middle December and the terminal date of ice period is in middle and late March in the next year.

#### **Seawater chemistry:**

Distribution of the dissolved oxygen in the seawater in Liaodong Bay shows a pattern of being low in the near shore areas and high in the offshore areas in spring and summer. While an opposite pattern occurs in fall and winter. The pH value in Liaodong Bay shows a horizontal pattern of being low in the near shore areas and high in the offshore areas. In contrast, the distribution of active phosphate in Liaodong Bay shows a pattern of being high in the near shore areas and low in the offshore areas through the year.

#### **Sedimentation chemistry:**

The sulfide in the sediments shows a horizontal distribution pattern of being high in near estuary and low in far estuary. The organic matter content distribution presents a horizontal pattern of being low in the near shore areas and high in the offshore areas. The total phosphorus content in the sediments shows a pattern of being high in east and being low in west. The total nitrogen content distribution exhibit a pattern of being high in the north marine areas and the near estuary areas while being low in the south marine areas and the areas far away from the estuary.

### **17. Physical features of the catchment area:**

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

The sea bottom along the coast mainly consists of bedrock and has a large steep slope with a water depth of 20-40 m. Liaodong Bay is located at the latitude 39°-41°N in the north of Bohai, considered as a marine area with the highest latitude in China. Air temperature decreases from ocean to continent with the coastal area being the transition zone. The annual extreme high temperature is higher in the west coast, reaching up to 40℃ while other places scatter between 34-36℃ (islands reach to 33℃). The average annual temperature is 9.3℃ in the oceanic area.

### **18. Hydrological values:**

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

The nature reserve is closely situated to the west of Dalian City, which is of significance in stabilizing the seashore and trapping sedimentation.

## 19. Wetland Types

### a) presence:

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

#### Marine/coastal:

<u>A</u>	<u>B</u>	C	<u>D</u>	E	F	<u>G</u>	H	I	J	K	Zk(a)
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#### Inland:

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

1	2	3	4	5	6	7	8	9	Zk(c)
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### b) Dominance:

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

**A:** Permanent shallow sea water area: 71% of the wetland;

**G:** Beach involving intertidal mud and sand: 8% of the wetland;

**B:** Seaweed layer involving sub-tidal algae and seaweed: 5% of the wetland;

**D:** Rock coast involving marine rock island and seaside cliffs: 3% of the wetland.

## 20. General ecological features:

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

This site lies in the southeast of Liaodong Bay where the bottom of the sea along the coast mainly consists of bedrock, has a large steep slope with a water depth of 20-40 m. This place has many islands, more than 70 coral reefs and a coastline more than 147.5 km. The nature reserve's major function is to protect spotted seals. Since the icing period in Liaodong Bay extends from the end of December to early March next year, there is a close relationship between the seals' breeding and water freezing and ice melting.

#### Habitat environment

Most sediments are terrigenous clastic substances in the seafloor of Liaodong Bay. In north of the bay, Liaohe river, Shuangtaizi river, Daling river and Xiaoling river merge into the sea carrying tons of grains with tiny particles smaller close to the shore and bigger in the south far from the beach. Surface deposits in the granules are Mud-silty Clay and Clayey mud. In the vicinity of the Changxing Island that lies in the east of the Bay presents variety of gravels with different sizes. Sandy sediment mainly distributes in the south.

#### Breeding and growth

The mature age for male spotted seals is between 3 and 4 years old and for the female between 3 and 5. The breeding period is from January to early February, while some individuals breed in the late February, occasionally.

### **Migration and Distribution**

During the autumn, the temperature of the water drops as the temperature changes. The spotted seals, which have entered the sea areas of China from the Sea of Japan, begin to migrate northward and travel through the Bohai Sea and enter the Nature Reserve. At this time, the nature reserve north coast water began to freeze. With the coming of the cold air, the ice on the static water along the coast is continually stretching outward and becoming thicker. With the attack of the Spring tide, strong winds and waves, especially, after the coming of spring, the frozen water has begun to crack and then into pieces. The spotted seals, after entering the Nature Reserve, begin to look for their individual mating partners and then to live in couple on the floating ice for the breeding period. January and February are the coldest months. The broken pieces of floating ice continue to extend toward outside. In mid-March, the temperature goes up. The floating pieces of ice begin to melt. The young seals are often seen at the ChangXing Island of Wafangdian of Dalian City and the north coastal area of Lushunkou. With the increase of temperature, the seals travel towards south and totally leave the nature reserve by mid-May.

### **21. Noteworthy flora:**

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

In the shallow sea water areas in the wetland coast, many plankton animals are low salinity and eurythermal species. Phytoplankton mainly consists of diatoms, 51 species of which account for 89% of the total species of phytoplankton in Liaodong Bay. Besides, there are a few Pyrrophyta, Chlorophyta, Chrysophyta, Cyanophyta and Eugleniphyta. Main species of algae include *Coscinodiscus*, *Melosira*, *Skeletonema*, *Rhizosolenia* and *Chaetoceros*, all of which account for 10% of one year biomass.

### **22. Noteworthy fauna:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. ***Do not include here taxonomic lists of species present - these may be supplied as supplementary information to the RIS.***

Nekton: there are 100 species of fishes, 3 species of shrimps, 2 species of crabs and 3 species of cephalopods plus 9 species of marine animals including *Phoca largha*, *Balaenoptera acutorostrata*, *Orcinus orca*, *Pseudorca crassidens*, *Pseudorca crassidens*, *Delphinus delphis*, *Neophocaena phocaenoides*, etc. Since the nekton is capable of long distance migration, the seasonal change of the species is quite significant. In winter, there are more than 10 species of fishes appearing in this sea water area, gathering in the central deep water area in Liaodong Bay.



Intertidal benthos: located at the farthest north of intertidal zone, Liaodong Bay possesses the relatively flat beaches, north of which get iced and is under the frozen layer in winter. Fifty two species of animal inhabit in Liaodong Bay.

Benthonic organism: high biology density in shallow sea, this is the mostly producing area of *S.subcrenat*.

Plankton: *Acetes Chinensis* and *Jellyfish* are direct objects in fishery production which mostly exist in marine area within the 20 m deep contour in northern Liaodong Bay.

Marine fishery resource: fish resource in Liaodong Bay fishery grounds mainly are *Setipinna taty*, *Scomberomorus niphonius*, *Collichthys lucidus*, *Pseudosciaenna polyactis*, *Scapharca broughtonii*, *Rhopilema esculentum*, *Hexagrammos otakii*, *Trichurus lepturus*, *Argyrosomus argentatus* etc.

Marine mammals: there are 9 species of the marine mammals among which whales cover the fin whale, minke whale, killer whales, false killer whale, common dolphins, bottlenose dolphins and finless porpoise; pinnipeds are spotted seals and North Sea lions. Liaodong Bay is a major inhabiting and breeding place for spotted seals in China.

### **23. Social and cultural values:**

**a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current economic value.**

Spotted seals' habitat is a natural 'Sea Park'. It is not only the variety of moving ice sheets and deposited bulks of ice but also spotted seals and their babies that strongly attract mass of domestic and foreign tourists. Protection towards spotted seals could not only provide the basis and the reference experiences for the worldwide research, but also boost the development of research on other marine mammals.

**b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?**

No.

If yes, tick the box and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

**24. Land tenure/ownership:**

**a) Within the Ramsar site:**

State ownership. The utilization right belongs to the local government and the reserve.

**b) In the surrounding area:**

The land within the Ramsar site has a land tenure of State-owned., while the utilization right belongs to the local government.

**25. Current land (including water) use:**

**a) Within the Ramsar site:**

The site is located within the national nature reserve. The core area of the reserve: 278490 ha (divided into north and south part), about 41.4% of the reserve. Buffer area: 271600 ha (divided into north and south part), about 40% of the reserve. Experiment area: 122185 ha (divided into north, center and south part), about 18.2% of the reserve.

**b) in the surroundings/catchment:**

mainly represented as marine waters.

**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

**a) within the Ramsar site:**

Shipping transportation could produce disturbance to the spotted seals.

**b) in the surrounding area:**

Port development within the Liaodong Bay could produce some negative influences on spotted seals.

**27. Conservation measures taken:**

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

**In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.**

In 1992, Dalian Spotted Seals Nature Reserve was established. In 1997, the reserve was upgraded to be national nature reserve and was added to the List of Wetlands of International Importance in 2002.

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

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

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

No

**d) Describe any other current management practices:**

According to “Regulations of The People’s Republic of China for The Implementation of Wild Aquatic Animal Protection” and “Regulations of The People’s Republic of China on Nature Reserves”, it is forbidden to secretly hunt and kill spotted seals and the project development is restricted.

Boost actively the investigation, monitoring and freeing the spotted seal population and provide the basis for the reserve management. Develop positively the scientific investigation, monitoring, propaganda and education of the nature resource of the spotted seals. Cure and free the spotted seals which are incidentally caught, sick and close to die or cubs on the ice by cooperating with the Liaoning Marine Fisheries Research Institute, Dalian Laohutan Polar Aquarium and Dalian Sun-Asia Ocean World. Since 1997, more than 2000 bulletins and over 10000 leaflets about spotted seals protection have been made and distributed; more than 30 key fishery ports and villages have been visited, covering more than 40000 kilometers; and over 200 young spotted seals are helped and cured which are reported more than 40 times by central, provincial or city media. Meanwhile, 14 illegal hunting cases have been punished rigorously with 88 spotted seals confiscated. In addition, four freeing activities in large scale have been organized with 112 spotted seals back to nature. Collaborating with Liaoning Marine Fisheries Research Institute, Dalian Laohutan Polar Aquarium and Dalian Sun-Asia Ocean World, we have carried six investigations on the spotted seals natural resources.

The site is not included in the Montreux record.

**28. Conservation measures proposed but not yet implemented:**

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

(1) ‘The Management Outline of the Da Lian National Spotted Seal Nature Reserve’ is under preparation.

(2) A management network over three provinces and one municipality is being established according to the spirit of the coordination meeting participated by three provinces and one municipality (Liaoning province, Hubei province, Shandong province and Tianjin city).

**29. Current scientific research and facilities:**

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

Current scientific research: with the support and assist of associated sectors, the management sector of the reserve always uphold the full development administration mode centered on the protection management and based on scientific research in their work for many years. So much research work have been done on spotted seal distribution, habitat environment, population structure, ecological habit and the resource condition of the spotted seals inhabiting in Bohai Sea that provide scientific basic for the well protection.

(1) International technology cooperation and communication

In 2002 and 2003, collaborating with America Pacific Environment Organization and

Liaoning Marine Fisheries Research Institute, the reserve management sector made aerial survey on the marine life diversity in Liaodong Bay and winter spotted seals. Also series of propaganda activities have been organized on environment protection, ocean protection and spotted seals protection. In addition, we have held a symposium on the marine environment protection. The supervision sector has chosen some staff sending them to reserves in America and Canada for on-the-job training on purpose of learning the advanced protection conception and management experience. In addition, we have invited several experts on marine mammals to visit and give lectures, making a wide technology communication on the wildlife protection interesting to all.

(2) Develop the scientific research associated with the spotted seals protection.

For ten years, the reserve acquired the scientific research project from the Department of Agriculture, Department of Forest, Liaoning province and Dalian city, and carried out genetic research on the spotted seals propagating in Bohai Sea, completed the genetic analysis on the spotted seals in Chinese marine area for the first time and provided the scientific basis for the management and scientific research. Also, collaborating with Sun-Asia Ocean World, some achievements were made in the study on prevention and control of the virus disease in spotted seals.

From January to April in 2003, the supervision sector has organized 3 time census on the natural resource of spotted seals in Liaodong Bay, on purpose of analyzing the spotted seals' restoration condition. The results revealed that the spotted seals population in Liaodong Bay has restored to 3000 from less 1000 over ten years before when the reserve is just established.

Scientific research facilities: four lookout platforms, equipping with high magnification telescopes and infrared telescopes have been established in Huping Island in Lvshun, Mayi Island in Jinzhou, Changxing Island and Xizhong Island in Wafangdian. These telescopes are used to monitor the secret hunting and disturbing activities to the spotted seals, as well as to observe spotted seals' activities.

One management station has been set up in either Changxing Island in Wangfangdian or Shuangdao town in Lvshun. They are used to inspect illegal behaviors involving whether fishery ship or the other ship violating the management regulation in the reserve and whether smuggle transaction of spotted seals exists.

One spotted seals aid center was established in Changxing Island in Wangfangdian, which is integrated with management, scientific research and aid service. The center is also equipped with dozens of management and scientific research staffs.

**30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

**e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.**

No carried out by now.

**31. Current recreation and tourism:**

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

No carried out by now.

### **32. Jurisdiction:**

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

The territorial jurisdiction belongs to the People's Government of Liaoning Province. The functional Jurisdiction belongs to Fishery Bureau of the Ministry of Agriculture.

### **33. Management authority:**

**Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.**

Principal: Zhang Guangwen

Management Institution: Dalian National Spotted Seal Nature Reserve

Address: Lianhe road, Xigang District, Dalian 116021, Liaoning Province

Tel: 86-411-84359061

Fax: 86-411-84357567

Email: zhangwei196@163.com

### **34. Bibliographical references:**

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

- [1] Wang Zhemao, Wang Peilie. Spotted Seals[M]. Beijing, Ocean Press, 1990, 139.
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