

Biological Assessment of Ecologically Important Areas For Marine Mammals in the Yellow Sea Ecoregion

China Part

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Ecological Sub-regions

Sub-region 1: The Bohai Sea

The Bohai Sea is a nearly closed interior sea located at the northernmost end of the east part of Mainland China between 37°07'~41°N and 117°35'~122°15'. It borders Liaoning province to the north, Hebei to the west, Shandong to the south, and Tianjin Municipality to the west and is connected to the Yellow Sea to the east via the Bohai Strait. The Bohai Sea covers an area of 77,284 km² and has a continental coastline of 2,668 km. With an average depth of 26 m and a maximum depth of 85 m, it has over half of its sea area in water shallower than 20 m (National Marine & Information Service, 2004a, b). The Bohai Sea receives freshwater from many rivers of varied sizes and the average salinity is 30 ppt. The coast of the Bohai Sea falls into the three types: silty and muddy coast, sandy coast, and bedrock coast. The coastal area of Bohai Bay, the Yellow River Delta and the north coast of Liaodong Bay is silty and muddy; the west coast of the Bohai Sea (starting from the north bank of the Luan River mouth) is generally sandy; and the north coast of the Shandong Peninsula and the west coast of the Liaodong Peninsula are largely bedrock (National Marine & Information Service, 2004b).

Sub-region 2: Yellow Sea

The Yellow Sea is a large gulf sharing the border with the Bohai Sea to the north and the East China Sea to the south; all three seas are parts of the Pacific Ocean. Located between Mainland China and the Korean Peninsula, the Yellow Sea receives its name from the silt particles that colour its water. The silt originates from large rivers including the Yellow River and the Liao River, both of which now pour into the Bohai Sea. The Yellow Sea covers an area of 380,000 km², with an average depth of 44 m and a maximum depth of 140 m. The average salinity is about 32; the sediments are primarily silt, mud, and fine sand. The current system of the Yellow Sea is basically formed by the Yellow Sea Warm Current and some near shore currents (National Marine & Information Service, 2004c).

The People's Republic of China, Democratic People's Republic of Korea, and Republic of Korea are the three countries that border this semi-enclosed body of water (Northeast Fisheries Science Centre Narragansett Laboratory, 2004).

Common Criteria for Identification of Ecologically Important Areas of YSE

The Mammal Taxonomic Group adopted the following common criteria to identify Ecologically Important Areas for mammals in Yellow Sea Ecoregion (YSE) (Table 1)

Table 1: List of Adopted Common Criteria for Mammal Taxonomic Group

Adopted Common Criteria	Selected Indicator Species/ Species Groups	Definition of Indicator Species	Definition of Ecologically Important Areas
Criterion 1: representative species/habitat types	Minke whale <i>Balaenoptera acutorostrata</i> , Finless Porpoise <i>Neophocaena phocaenoides</i>	Abundant species	Major area of distribution
Criterion 2: endemism and unique species assemblages (endemic to the Bohai Sea/ Yellow Sea / East China Sea)	Largha seal <i>Phoca largha</i>	Isolated population endemic to the Bohai Sea and coastal waters of the north Yellow Sea.	Southernmost breeding ground of Largha seals in the Bohai Sea
Criterion 3: species richness	not adopted	not adopted	not adopted
Criterion 4: species of special concern 1 (threatened and/or protected species)(depleted stocks)	Finless porpoise <i>Neophocaena phocaenoides</i> , Gray whale <i>Eschrichtius robustus</i>	The finless porpoise is abundant along the coastal waters, but having unique local populations that need special attention. Gray whale is critically endangered.	finless porpoise <i>Neophocaena phocaenoides</i> <i>asiaorientalis</i> has only known freshwater population in the Yangtze River and <i>Neophocaena phocaenoides sunameri</i> distributes both in the Bohai sea and Yellow Sea Migration route for Gray whale
Criterion 5-A: Commercially important (Volume)	not adopted	not adopted	not adopted
Criterion 5-B: commercially important (Value)	not adopted	not adopted	not adopted
Criterion 6: intact habitat / ecological processes	waters off the Korean demilitarized zone	no human disturbance	waters off the Korean demilitarized zone

Selected Indicator Species under Criterion 1: Representative Species/ Habitat Types

Definition of Indicator Species under Criterion 1: Representative species and/or habitat types are those species that are highly abundant in YSE.

[Minke whale] *Balaenoptera acutorostrata* [小须鲸, Xiao Xu Jing]

Reason for Selection: The minke whale is considered to be one of the most abundant species in the YSE (Wang, 1978, 1982, 1984).

[Finless porpoise] *Neophocaena phocaenoides* [江豚, Jiang Tun]

Reason for Selection: Finless porpoise is abundant along the coastal waters.

Ecologically Important Areas:

Major areas of distribution of the minke whale and finless porpoise.

Indicator Species under Criterion 2: Endemism and Unique Species Assemblages

Definition of Indicator Species under Criterion 2: There are no endemic marine mammals at the species level in the YSE, however local populations of species that are endemic to the YSE were selected as Indicator Species.

Largha seal (*Phoca largha*)

Reason for Selection: The Largha seal in the YSE is an isolated population (Wang, 1988; Zhu et al. 2000) endemic to the Bohai Sea and coastal waters of the north Yellow Sea.

Ecologically Important Areas: Southernmost breeding grounds of Largha seals in the Bohai Sea.

Indicator Species under Criterion 3: Species of Special Concern

Definition of Indicator Species under Criterion 3: Species that are listed in either national or international lists of threatened species were selected as Indicator Species.

Finless porpoise (*Neophocaena phocaenoides*)

Reason for Selection: The finless porpoise is abundant along coastal waters, but there are local populations that need special attention (Wang, et al. 1989; Zhu et al. 2000; Zhu et al. 2004). The population inhabiting the Yangtze River is the only known freshwater finless porpoise population in the world (Liu et al. 1996; Zhang et al. 2001).

Gray whale (*Eschrichtius robustus*)

Reason for Selection: Gray whale is critically endangered (Brownell, 1999; Brownell et al. 1997; Zhu and Yue, 1998; IWC, 2002; Weller et al. 2002).

Criterion 6: Intact Habitat/ Ecological Processes

Definition of Intact habitat/ecological processes under Criterion 6: Waters off the Korean demilitarised zone has no human disturbance and provides an important habitat for some species.

Table 2: List of selected Indicator Species

Selected Indicator Species	Criterion 1: Representative species/ habitat types	Criterion 2: Endemism and unique species assemblages	Criterion 3: Species of Special Concern
Minke whale <i>Balaenoptera acutorostrata</i>	X		
Finless porpoise <i>Neophocaena phocaenoides</i>	X		X
Largha seal <i>Phoca largha</i>		X	
Gray whale <i>Eschrichtius robustus</i>			X

Note: X indicates that the species was selected under the corresponding criterion.

Maps and Description of Ecologically Important Areas for Mammal Taxonomic Group**Table 3: List of Maps and Area Names for Mammal Ecologically Important Areas**

Map Number	Indicator Species.	Area Names for Mammal Ecologically Important Areas
Map 1	Gray whale (<i>Eschrichtius robustus</i>)	The Bohai Sea and Yellow Sea
Map 2	Largha seal (<i>Phoca largha</i>)	Dalian Natural Reserve

Ecologically Important Area for the Minke Whale (*Balaenoptera acutorostrata*) and the Finless Porpoise (*Neophocaena phocaenoides*)

Finless porpoises distribute widely along the coast of the Yellow Sea, and the Bohai Sea. Minke whales are in found all over the Yellow Sea and the Bohai Sea.

Knowledge gaps and specific studies needed

Population, biology, and human-caused mortality of both the minke whale and the finless porpoise are poorly known., this gap should be filled by more studies in the future.

Mammal Ecologically Important Area for Gray Whale (*Eschrichtius robustus*) (Map 1)

Mammal Ecologically Important Area for Gray Whale (Map 1)

Area Name:

Zhuanghe, Dachangshan Island, Wangjia Island, Jin Couty, Huangcheng Island, and Yantai

Location:

Shandong Province and Liaoning Province

Description of Area:

The Yellow Sea and Bohai Sea

Knowledge gaps and specific studies needed:

Breeding grounds, population, and bycatch are poorly known and need to be studied in the future.

Mammal Ecologically Important Area for the Largha Seal (*Neophocaena phocaenoides*) (Map 2)

Area Name:

Dalian Nature Reserve and surrounding sea area with pack ice in the Bohai Sea

Location:

Dalian City, Liaoning Province, China

Description of Area:

Dalian Nature Reserve and surrounding sea area with pack ice in Bohai Sea is an Ecologically Important Area as the southernmost breeding grounds of Largha seal. Knowledge gaps and specific studies needed:

Migration route and population structure have not been studied.

Knowledge Gaps and Specific Studies Needed for Mammals

In addition to the knowledge gaps specific to Indicator Species, at the ecosystem level, there is a knowledge gap about the bycatch and population of all the marine mammals.

Knowledge Gaps and Specific Studies Needed for Marine Mammals

In addition to the knowledge gaps specific to Indicator Species, at the ecosystem level, there is a general lack of research on bycatch and the population of all the marine mammals.

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Notes:

Conservation Priorities of Marine Mammals

- A. Marine mammal biodiversity
- B. Strandings network
- C. Bycatch
- D. Population
- E. Pollution

List of priority species

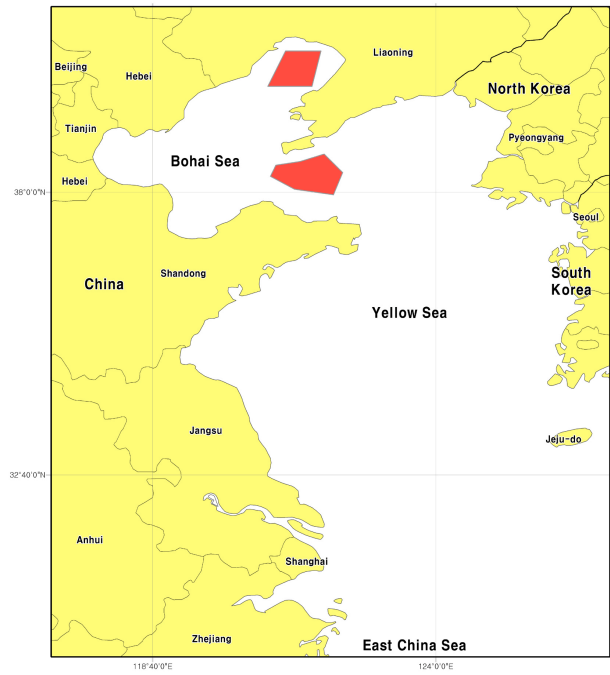
- A. Largha seal
- B. Finless porpoise
- C. Mink whale
- D. Baiji (freshwater)
- E. Gray whale

Note: The gray whale is critical endangered and should be listed as a Class 1 protected species in China.

The finless porpoise, bottlenose dolphin and false killer whale used to be very common according to past literature, and are still caught as bycatch now. More studies on their population, biology and genetics are needed.



Map1 Gray whale (*Eschrichtius robustus*)



Map2 Larga seal (*Phoca largha*)