

# Globally Significant Coastal Plants in the Yellow Sea Ecoregion

Table of coastal plant indicator species and their global significance

Indicator Species		Criteria for habitat and vulnerable species of global significance		
Scientific names(Synonym)	Criterion 1: Endemism	Criterion 2: Vulnerable Species	Criterion 3: Commercially Important Species	Criterion 4:Representation of all major habitat types(Definition: Subtidal, intertidal, sandy beach)
<i>Zostera marina</i>		K		sub-tidal flat
<i>Suaeda glauca</i> ( <i>Suaeda asparagoides</i> )			C	intertidal wetland
<i>Suaeda maritima</i>				intertidal wetland
<i>Suaeda japonica</i>				intertidal wetland
<i>Salicornia herbacea</i> ( <i>Salicornia europaea</i> )		K	CK	intertidal wetland
<i>Aeluropus littoralis</i> var. <i>sinensis</i>				intertidal wetlandestuary
<i>Phragmites communis</i>			C	intertidal wetlandestuary
<i>Tamarix chinensis</i>				intertidal wetlandestuary
<i>Scirpus triqueter</i>		K		intertidal wetland
<i>Scirpus mariqueter</i>	C			intertidal wetland
<i>Carex scabrifolia</i>				intertidal wetlandestuary
<i>Carex kobomugi</i>				sand dune
<i>Zoysia sinica</i>				intertidal wetland
<i>Vitex trifolia</i> var. <i>simplicifolia</i>			C (medicinal plant use, but no statistics on commercial importance)	sand dune
<i>Glehnia littoralis</i>		C,K		sand dune
<i>Rosa rugosa</i>		C,K		sand dune
<i>Triglochin maritimum</i>		K		intertidal wetland
<i>Limonium tetragonum</i>		K		intertidal wetland
<i>Artemisia scoparia</i>		K		intertidal wetland
<i>Aster tripolium</i>		K		intertidal wetland
<i>Lathylus japonica</i>				sand dune
<i>Calystegia soldanella</i>				sand dune

## Notes

Each indicator species were assessed against Criterion 1, 2 and 3. When an indicator species meets Criterion 1 according to data available in China, then it is indicated by C (China).

Note 1: In Criterion 1,2 and 3 columns, C indicates that a criterion is applicable to the corresponding species according to data from China, K: South Korea.

Note 2: IUCN CR, IUCN EN, and IUCN VU indicate the species is classified as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) respectively in the IUCN Red List of Threatened Species.

Note 3: In Criterion 4 column Yes indicates the Ramsar criteria on waterbirds were applied to the corresponding species.

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*Salicornia herbacea*



*Phragmites communis*



*Carex kobomugi*



*Rosa rugosa*

# Coastal Plants of the Yellow Sea Ecoregion



Satellite photo of Yellow Sea Ecoregion

*Salicornia herbacea* - a representative coastal plant of intertidal wetlands

## Coastal Plants and the Yellow Sea Ecoregion

### About the area

The Yellow Sea Ecoregion is one of the world's largest areas of continental shelf. The Yellow Sea Ecoregion encompasses the Bohai Sea, the Yellow Sea and the East China Sea. It is a transboundary area, and extends from the coastlines of China, North Korea, and South Korea to a depth of 200m.

Valuable nutrients flow from the Yangtze and Yellow rivers and combine with sunlight and shallow waters to create an area that teems with abundant marine life.

### Diversity of coastal plant species and community types

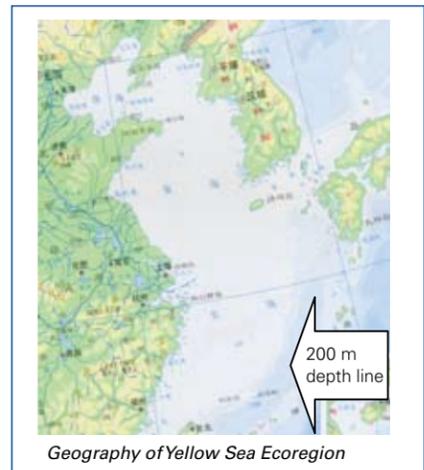
The term coastal plant has a broad meaning and can include many different sub groups of plant species in the Yellow Sea Ecoregion. Included in the definition of coastal plants by the Yellow Sea Ecoregion Planning Programme are vascular plant species in coastal dunes and beaches, intertidal flats, and sub-tidal areas. They do not include phytoplanktons (small plant planktons), although they are also an important part of the marine ecosystem of the Yellow Sea Ecoregion.

In China, coastal marshes can be divided into 10 major community types such as the *Suaeda salsa* type in the upper intertidal zone to inland, the *Salicornia europaea* type inside and outside sea dikes, or the *Scirpus mariqueter* type intertidal zones with solid sandy bottom. Sea grass species, such as the *Zostera* species (eelgrasses), are found in waters off Shandong, Hebei and Liaoning Provinces.

In South Korea, representative species among halophyte species (plants that live in salt marshes and sea coast) are: *Zostera marina* (eelgrass; abundant and dominant in sub-tidal flats), *Phragmites communis* (reed; found in estuaries), *Zoysia sinica*, *Suaeda maritima* and *Carex scabrifolia* (found in mean high tide level areas), and *Suaeda japonica* (in intertidal flats).

### What is an ecoregion?

Biodiversity is not spread evenly across the Earth but follows complex patterns determined by climate, geology and the evolutionary history of the planet. These patterns are called ecoregions. WWF defines an ecoregion as a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions. The boundaries of an ecoregion are not fixed and sharp, but rather encompass an area within which important ecological and evolutionary processes most strongly interact.



Geography of Yellow Sea Ecoregion

## Coastal Plants and People

Coastal plants have been providing a variety of ecosystem services both directly and indirectly to people in the Yellow Sea Ecoregion.

Some coastal plants are economically important. Seed oil of *Suaeda glauca* was studied and found to contain medicinal properties. This plant is also eaten in China. Reeds have long been harvested as a building material and to make paper in China. Coastal plants also provide indirect benefits. Eelgrass in shallow coastal waters support fisheries by providing spawning grounds for fish and natural communities of coastal plants help protect coastlines from erosion.



Reeds being harvested in China for making paper

## Threats to Coastal Plants

Large-scale habitat loss is a serious threat to coastal plants in the Yellow Sea Ecoregion.

Habitat loss is mainly caused by conversion of coastal wetlands by reclamation into agricultural land, salt pans, fishponds and other industrial and urban development. Extensive coastal habitat loss has already happened in the Yellow Sea Ecoregion. In South Korea, about 43% of intertidal wetlands have been lost during the 20th century. In China, about 37% of intertidal wetlands have been converted in the last 50 years.

Sea grass beds in China have been in decline since 1940 and more than one third of them have been lost due to pollution and damage by boat propellers and anchors.

# The Yellow Sea Ecoregion - a Global Treasure, a Global Concern

## Global Treasure

The Yellow Sea Ecoregion (203) has been selected by WWF as one of the Global 200 ecoregions, areas that are key to global biodiversity conservation. This marine ecosystem is also one of the Large Marine Ecosystems (LME) of the world.

## Global Concern

The global importance of the Yellow Sea Ecoregion has been recognised by governments and the international community in recent years. Starting in 1992, the Chinese and South Korean governments together developed a transboundary approach to the management of the Yellow Sea area with the assistance of UNDP, UNEP, the World Bank, and NOAA. In 2005, a UNDP/GEF project, the Yellow Sea Large Marine Ecosystem project, was officially launched with participation of the Chinese and South Korean governments.

Meanwhile, in 2002, WWF and other research institutes in China, South Korea and Japan began an assessment of Yellow Sea Ecoregion biodiversity. The objective of this regional partnership was to prioritise conservation actions based on scientific data.

## An urgent need: Identifying conservation priorities at a transboundary ecoregional scale

In order to conserve the full array of biodiversity and ensure the use its services by people are sustainable, it is necessary to conduct assessments beyond political boundaries and at an ecoregional scale.

An ecoregional approach helps ensure that we do not overlook areas that are particularly unique or threatened, allowing for smarter trade-offs and greater positive impacts that are more likely to endure over time.

# Methodology - finding priority coastal plant species and their Ecologically Important Areas

## A work through international cooperation among scientific experts from China and South Korea

Scientists from universities and environmental research institutes in China and South Korea cooperated to review and identify priority coastal plant species and their habitat of global significance. Two international workshops and two national workshops were organised to set a common methodology and reached an agreement on priorities.

## Biological Assessment

Using a set of mutually agreed criteria that are key to biodiversity conservation - endemism, threatened species status, and commercial importance - scientists analysed nationally available data to select appropriate indicator species and ecologically important areas, and compiled national Biological Assessment papers for China and South Korea.

## Priority Area Analysis

Using a further set of criteria, scientists further prioritised the selected important species and important habitats. Scientists adopted representative habitat types, endemism, threatened status, and commercial importance as a set of criteria for the Priority Area Analysis. Taxonomy of coastal plant species is a complex issue as there are more than one scientific name given to what may be the same species.

# A call to actions

The results provided key data for developing a regional conservation strategy and monitoring its successes. In particular, the results will help to:

- 1) Establish a network of representative marine protected areas at the ecoregional scale;
- 2) Evaluate effectiveness of existing protected areas;
- 3) Monitor status of biodiversity.

In order to conserve these globally significant species and their habitats, various stakeholders need to take concerted actions. Community-based

organisations, the scientific community, national and local government agencies, legislative bodies, non-government organisations including religious groups, the general public, the media, donor communities, industries, consumers, and youth groups all have important roles to play. For example, national and local government agencies can contribute by strengthening cross-sectoral coordination in the establishment and improvement of the management of marine protected areas (MPAs). Filling major knowledge gaps in ecology and human impacts on indicator species is also an important action to take.



Yellow Sea Ecoregion (203)



LME #48 Yellow Sea Large Marine Ecosystem (red area)



UNDP/GEF Yellow Sea Project

WWF/KORDI/KEI Korea Environment Institute  
WWF/KORDI/KEI Yellow Sea Ecoregion Planning Programme




Globally Significant Areas for Coastal Plants in Yellow Sea Ecoregion (China and South Korea)  
- Yellow Sea Ecoregion Planning Programme -




Geographic Coordinate System : WGS-84  
Projection : Lambert Conformal Conic

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Bathymetry		Coastal Plant EIA			
No	Coastal Plant EIA	No	Coastal Plant EIA	No	Coastal Plant EIA
1	Yangtze River Estuary	8	Nandagang Marsh	15	Sinduri
2	Yangcheng Beach	9	Qinghuangdao Sand Beaches	16	Mangyeong and Dongjin Estuaries -Hampyeong Bay
3	Lu-su Coast	10	Liaoh River Delta	17	Jindo - Suncheon Bay
4	Rongcheng Beach	11	Dalian Bay		
5	Jiaodong Peninsula Coast	12	Changhai Islands		
6	Laizhou Bay East Coast	13	Yalujiang River Mouth		
7	Huanghe River Delta	14	Baengnyeongdo-Ganghwa-do-Jawoldo Islands		