

Location



Introduction

The Republic of Korea (ROK) or South Korea is a peninsular country in eastern Asia bounded on the north by the Democratic People's Republic of Korea (North Korea), on the east by the Sea of Japan/East Sea, on the south by the East China Sea/South Sea, and on the west by the Yellow Sea. The country is across the Korea Strait from Japan and across the Yellow Sea from China. The Cheju Strait separates the mainland from Jeju-do (Cheju-do) Island, and the Korea Strait separates the country from the Japanese island of Tsushima.

The ROK coast is approximately 2,413 km long and includes the islands of Cheju-do to the southwest, *Ulleung Island* and *Tok-do* (Liancourt Rocks) in the Sea of Japan, *Ganghwa Island* at the mouth of the *Han River* and many other smaller islands.

South Korea's climate ranges from humid, subtropical to humid continental and is affected by the East Asian monsoon. Rains from the monsoon are strongest in June and July, however, they generally last through September. Summer typhoons may create strong winds, heavy rains and occasional flooding.

The country is involved in periodic incidents with the People's Republic of Korea in the Yellow Sea, regarding the Northern Limit Line, which South Korea considers its maritime boundary. Both Japan and South Korea claim Tok-do/Take-shima (the Liancourt Rocks), which have been occupied by South Korea since 1954.

Regional Seas and Biogeography

The Republic of Korea is a peninsula surrounded by three major bodies of water:

- Yellow Sea (West)
- South Sea or East China Sea (South)
- Sea of Japan (West)

Large Marine Ecosystems:

- Yellow Sea
- East China Sea
- Sea of Japan/East Sea

The warm Tsushima Current originates in the East China Sea and interacts with the colder Kuroshio Current. The East China and Yellow Seas are shallow but productive waters. The Sea of Japan is a semi-enclosed sea with limited tidal flow through two straits in the north and two in the south.

Habitats

The west coast is composed mainly of sandy and pebble beaches with extensive tidal flats and offshore islands. The east coast has steep cliffs and rocky shorelines with smaller, isolated sandy beaches.

-> **Tidal mudflats:** There are extensive tidal mudflats in the southeast and along the west coast, less on the east coast

-> **Seagrass beds:** Found extensively along the Korean coast, particularly along the east coast. They are more scattered on south and west coast

-> **Saltmarshes:** Found on the west coast

-> **Estuaries:** There are 4 estuaries, two on the west coast (*Hangang river* and *Geumgang river*) and two in the south (*Seomijn* and *Nakdong river*)

Biodiversity Hotspots

In this section, acronyms and abbreviations are used for some of the most common types of hotspot: Ramsar Wetland of International Importance (Ramsar), National Park (NP), Marine Protected Area (MPA) and Important Bird Area (IBA).

→ UNESCO World Heritage site

The *Getbol* (GaetBeol) *Tidal Flats* are a UNESCO World Heritage site on the southern and southwestern coast comprised of four component areas: *Seocheon Getbol* (also RAMSAR site), *Gochang Getbol*, *Shinan Getbol* and *Boseong-Suncheon Getbol*. The area has four tidal flat subtypes (estuarine, open embayed, archipelago and semi-enclosed) and hosts at least 118 migratory bird species and more than 2000 species of flora and fauna, of which 22 are globally threatened or near-threatened.

→ RAMSAR Sites

There are seven important area protected as RAMSAR sites.

Two are found in the southeast: *Suncheon Bay* (also an IBA), which has both tidal mudflats and shallow salt marshes and supports at least 25 protected avian species, including waders, ducks, gulls, and cranes. Also *Dongcheon Estuary*, which is a transition zone between river and marine environments with reed beds and rice fields, and is a vital wintering and stopover site for 238 species of birds, of which at least 13 are globally threatened.

The rest are found on the west coast. The areas are listed from north to south:

Songdo Tidal Flat, which includes two sections of a larger area of tidal mud flat along the coast of Incheon Metropolitan City, which has a complicated coastline with about 170 large and small islands. The area is an important feeding and roosting area for waterbirds particularly gulls and waders.

Daebudo Tidal Flat which is composed of the *Sangdong* and *Goraetburi tidal flats* on *Daebu Island* in the Yellow Sea and is a key stopover point on the East Asian-Australasian Flyway, particularly for migratory waterbirds, including some which are globally threatened.

Seocheon Tidal Flat, which is also a UNESCO World Heritage site and is an open tidal flat linked directly to the ocean, composed of sand and mudflats important for migratory birds during winter and as a breeding ground in summer.

Gochang and *Buan Tidal Flats* include two protected areas, the *Buan Julpo Bay Wetland Protected Area* and the *Gochang Tidal Flat Wetland Protected Area*. These are important tidal flats for migratory waterbirds along the west coast of the ROK, providing roosting sites for migratory birds and shorebirds.

Muan Tidal Flat (also an IBA), is an intertidal sand and mudflat ecosystem on the Yellow Sea hosting at least 49 species of wintering waterbirds, including gulls and wading species and several globally threatened species.

Jeungdo Tidal Flat which consists of tidal flats surrounding islands in the southwest of the country, provides feeding and resting areas for migratory waders, ducks and gulls, several of which are globally threatened.

→ National parks

Most of the NPs with a coastal interface are located on the south and west coast of the ROK.

Three main NPs host marine birds and mammals: *Dadohaehaesang NP*, the largest in the country, has marine birds and mammals including whales and seabirds. *Hallyeohaesang NP* has porpoise, coastal otter species and more than 100 bird species, some of which are marine species. *Taeanhaean NP* has whales, porpoise, coastal otters and marine and shorebirds.

→ Other IBAs

There are many IBAs along the Korean coast which meet the highest level of criteria for inclusion (A1) but for which little to no information is available. From north to south, these include the Tidal Flat Area of *Ganghwa-do Island*, the Tidal Flat Area of *Yeongjong-do Island*, *Sihwa-ho Lake*, *Namyang Bay* and *Asan Bay*, *Cheonsu Bay*, *Geum-gang River* and Estuary, *Mangyeong Estuary* and *Dongjin Estuary* and *Baeksu Tidal Flat* on the west coast, *Yeongnam-ho Lake* and *Geum-ho Lake*, *Gocheonam-ho lake* on the south and *Nakdong-gang Estuary* to the west.

At risk Wildlife

In this section, some individual wildlife species are mentioned followed by a letter in parentheses. These are species included in the IUCN Red List of Threatened Species within the top three categories of risk - Vulnerable to extinction (VU), Endangered (EN) or Critically Endangered (CR). A more complete list of IUCN listed species is found in Appendix 1.

→ At risk birds

The numerous tidal flats on the west coast of the country are famous for large numbers of migratory and wintering birds, including a significant number of IUCN listed species. Shorebirds, waders and gulls predominate but ducks, geese and grebes are common and some land-based species may be found on the coast during migration.

→ At risk reptiles

Five species of sea turtle have been recorded in the ROK waters but only the Green turtle and the Loggerhead turtle are confirmed to nest in the country on *Cheju-do Island*. Hawksbill, Olive ridley and Leatherback sea turtles are rare vagrants.

→ At risk mammals

More than 20 species of cetacean are found in the waters off the ROK, most commonly off the east coast. Nearshore species include the North Pacific right whale and the Narrow-ridged finless porpoise. Steller sea lions, Spotted seals, Ringed seals, and Ribbon seals are found along the coast of northeastern the ROK and Eurasian otters may forage in coastal waters in that area.

Past experience with oil spill and potential risks

The ROK has experienced a significant number of spills due to the nature of the coastline, climate, and heavy ship traffic in the region. Many of these spills have impacted wildlife to a greater or lesser extent.

In 1995 the tanker *Sea Prince* ran aground near Yosu, catching fire and spilling 5,000 tons of crude oil on the southern coast. Little information is available regarding wildlife impact.

In 2007, near Taean in the Yellow Sea, the tanker *HeBei Spirit* was hit by a Samsung barge that had broken loose and spilled approximately 10,500 tons of heavy crude oil. A limited wildlife response was attempted by the Korea Animal Welfare Association (KAWA), a largely domestic animal rescue organization, with the remote assistance of Focus Wildlife (Canada). An oiled bird cleaning facility was set up to respond to more than 300 oiled birds, the majority of which were black-tailed gulls.

The Northwest Pacific Action Plan (NOWPAP)'s Marine Environmental Emergency Preparedness and Response Regional Activity Centre (MERRAC) monitored the situation during the 2018 Sanchi tanker spill in the waters of China and allowed Japan and the ROK to provide information to Chinese authorities.

There is significant oil and gas exploration occurring in the far north, particularly in the BoHai Sea, which is a small, nearly enclosed basin of the Yellow Sea. The area already suffers from chronic oiling problems, with beaches being coated in oil every winter and oiled birds being found as a result.

In the South or East China Sea the main danger is from the high volume of shipping through the area. In the East Sea or Sea of Japan, there is the lowest risk, and the waters are deeper than the Yellow Sea, although there is some shipping traffic. One issue that may arise if spills occur here is that there are disputes between the ROK and Japan over this area.

International and Regional Treaties and Agreements

→ Oil spill and HNS Response

- d CLC Convention 69
- CLC Protocol 76
- CLC Protocol 92
- FUND Protocol 76
- FUND Protocol 92
- FUND Protocol 2003
- LLMC Convention 76
- LLMC Protocol 96

- ☒ OPRC Convention 90
- ☐ HNS Convention 96
- ☐ HNS PROT 2010
- ☒ OPRC_HNS 2000
- ☒ BUNKERS CONVENTION 01

→ Marine Biodiversity Protection

- Action Plan for the Protection, Management and Development of the Northwest Pacific Region (NOWPAP) and its Regional Oil and HNS Spill Contingency Plan (RCP)
- Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)
- Memorandum of Understanding between Republic of Korea and Japan

Oil Spill Response and HNS Spill Response

→ National Contingency Plan?

There is a National Disaster Prevention Master Plan, prepared by the Korean Coast Guard (KCG) in 2000 based on the requirements of the Korean Marine Pollution Prevention Act. The Korean Ocean Research & Development Institute (KORDI) was also involved in mapping sensitive areas and modelling of spill scenarios.

The NOWPAP Regional Oil and HNS Spill Contingency Plan defines cooperation between its five contracting parties for mutual response in the waters of the Northwest Pacific. PEMSEA has an MoU with Oil Spill Response (OSRL) for strengthening subregional contingency planning.

→ Role of Competent National Authorities

KCG, a department of the Ministry of Public Safety and Security (MPSS), has a Marine Pollution Response Bureau which has oversight of spill response in the country. The KCG has five regional centres (Donghae, Busan, Mokpo, Incheon and Jeju).

In addition, under Article 97 of the Marine Environment Management Act, the Korea Marine Environment Management Corporation (KOEM), a national company, is charged with enhancing capability to respond to marine pollution (at sea and on shore) by developing joint training programmes with relevant government agencies and private companies on teamwork strategies and emergency response reporting, contact and mobilisation training. KOEM was involved in the 2020 removal of oil from a ship, the *Jehoenho*, which sank off of Busan in 1993.

In the event of a major spill, the NOWPAP's Activity Centre MERRAC, based in Korea, would be notified to activate a larger response.

Oiled Wildlife Preparedness and Response

→ Formal guidelines?

As of 2020 there were no laws, regulations or guidelines for oiled wildlife response. However, over a million volunteers responded to help clean up the oil during the *HeBei Spirit* spill. In 2020 a paper by faculty from the Department of Ocean Environmental Sciences at Chungnam National University, School of Earth and Environment Sciences and Research Institute of Oceanography at Seoul National University, Department of Marine Biotechnology at Anyang University, NOWPAP MERRAC, and the Korea Research Institute of Ships and Ocean Engineering reviewed past experience and made a first attempt to prepare for future oiled wildlife response development.

→ Response objectives and strategy

Current processes focus on post-spill impact assessment.

→ Euthanasia or rehabilitation?

In 2007 during the *HeBei Spirit* spill, efforts were made to respond to oiled wildlife, but no organised survey or collection of animals occurred. Information regarding numbers of animals and success rate are not available but this effort suggests that there is interest in rehabilitation.

→ Impact assessment

Impact assessment in the future would likely involve the facilities involved in developing the paper mentioned above.

→ Notification and early response

There are no mechanisms in place at present for notification of, and early response to, oil impacted wildlife.

→ Wildlife responders

There is no oiled wildlife expertise in the ROK. KAWA, which organised the response to wildlife during the *HeBei Spirit* spill in 2007, is still active but it's focus continues to be on domestic and captive animals, rather than oiled wildlife.

The authors of the above paper, the Seoul Grand Park Zoo and the Seoul National University's College of Veterinary Medicine may be a source of assistance in the event of a spill.

In the event of a major spill international assistance would be needed.

→ Cooperation between stakeholders

The above-named organisations, institutions, NGOs and government agencies, as well as NOWPAP and PEMSEA, would likely work together should a response to wildlife be mounted.

→ Permanent facilities

There are no permanent facilities for rehabilitation of oiled wildlife.

→ Current processes

The paper cited above suggests that steps are being taken to initiate preparedness for oiled wildlife response.

Documentation and references

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 - UNESCO World Heritage: Getbol South Korean Tidal Flat: <https://whc.unesco.org/en/list/1591>
 - RAMSAR: <https://www.ramsar.org/wetland/republic-of-korea>
 - IBA: <https://maps.birdlife.org/marineIBAs/>
- Birdlife Data Zone: <http://datazone.birdlife.org/home>

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Appendix 1

→ **At risk birds**

Common name / Latin name / IUCN Red List Category (CR,EN,VU) / Resident-Migratory (season) / Breeding-Nesting-Pupping (season)

Crested shelduck / *Tadorna cristata* / CR / Unknown seasonality or breeding status / Unknown
Spoon-billed sandpiper / *Calidris pygmaea* / CR / Migratory / Non-breeding
Chinese crested tern / *Thalasseus bernsteini* / CR / Resident / Breeding
Scaly-sided merganser / *Mergus squamatus* / EN / Migratory / Non-breeding
Red-crowned crane / *Grus japonensis* / EN / Migratory / Non-breeding
Oriental stork / *Ciconia boyciana* / EN / Migratory / Non-breeding
Black-faced spoonbill / *Palatalea minor* / EN / Resident / Breeding
Asian crested ibis / *Nipponia nippon* / EN / Possible regionally extinct / Non-breeding
Far eastern curlew / *Numenius madagascariensis* / EN / Migratory / Non-breeding
Great knot / *Calidris tenuirostris* / EN / Migratory / Non-breeding
Spotted greenshank / *Tringa guttifer* / EN / Migratory / Non-breeding
Swan goose / *Anser cygnoid* / VU / Migratory / Non-breeding
Lesser white-fronted goose / *Anser erythropus* / VU / Resident / Breeding
Long-tailed duck / *Clangula hyemalis* / VU / Migratory / Non-breeding
Common pochard / *Aythya farina* / VU / Migratory / Non-breeding
Horned grebe / *Podiceps auritus* / VU / Migratory / Non-breeding
Swinhoe's rail / *Coturnicops exquisitus* / VU / Migratory / Non-breeding
White-naped crane / *Grus vipio* (formerly *Antigone vipio*) / VU / Migratory / Non-breeding
Hooded crane / *Grus monacha* / VU / Migratory / Non-breeding
Short-tailed albatross / *Phoebastria albatrus* / VU / Seasonality uncertain / Unknown
Japanese night-heron / *Gorsachius goisagi* / VU / Resident / Breeding
Chinese egret / *Egretta eulophotes* / VU / Resident / Breeding
Saunders's gull / *Saundersilarus saundersi* / VU / Resident / Breeding
Black-legged kittiwake / *Rissa tridactyla* / VU / Migratory / Non-breeding
Relict gull / *Larus relictus* / VU / Migratory / Non-breeding
Japanese murrelet / *Synthliboramphus wumizusume* / VU / Resident / Breeding
Steller's sea eagle / *Haliaeetus pelagicus* / VU / Migratory / Non-breeding

→ **At risk reptiles**

Common name / Latin name / IUCN Red List Category (CR,EN,VU) / Resident-Migratory (season) / Breeding-Nesting-Pupping (season)

Hawksbill turtle / *Eretmochelys imbricata* / CR / Migratory / Rare visitor
Green turtle / *Chelonia mydas* / EN / Migratory / Nesting

Loggerhead turtle / *Caretta caretta* / VU / Migratory / Nesting
Olive ridley turtle / *Lepidochelys olivacea* / VU / Migratory / Rare visitor
Leatherback turtle / *Dermodochelys coriacea* / VU / Migratory / Rare visitor

➔ **At risk mammals**

Common name / Latin name / IUCN Red List Category (CR,EN,VU) / Resident-Migratory (season) / Breeding-Nesting-Pupping (season)

North Pacific right whale / *Eubalaena japonica* / EN / Resident / Breeding/Calving (winter, in temperate waters)

Narrow-ridged finless porpoise / *Neophoca asiaeorientalis* / EN / Resident (Yellow Sea) / Breeding March to June/Calving spring summer or winter, depending on location

Sei whale / *Balaenoptera borealis* / EN / Migratory / Non-breeding/non-calving

Blue whale / *Balaenoptera musculus* / EN / Migratory / Non-breeding/non-calving

Northern fur seal / *Callorhinus ursinus* / VU / Resident / Non-breeding

Sperm whale / *Physeter macrocephalus* / VU / Migratory / Non-breeding/non-calving

Fin whale / *Balaenoptera physalus* / VU / Migratory / Non-breeding/non-calving