

# Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

Available for download from [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm).

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9<sup>th</sup> 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 14, 3rd edition). A 4th edition of the Handbook is in preparation and will be available in 2009.
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.

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

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(Liaison of MLTM; Ministry of Land, Transport and Maritime Affairs)

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Designation date

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Site Reference Number

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

November 23, 2009

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### 3. Country:

Republic of Korea

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### 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.

Seocheon Tidal Flat

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### 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

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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:

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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 ✓.

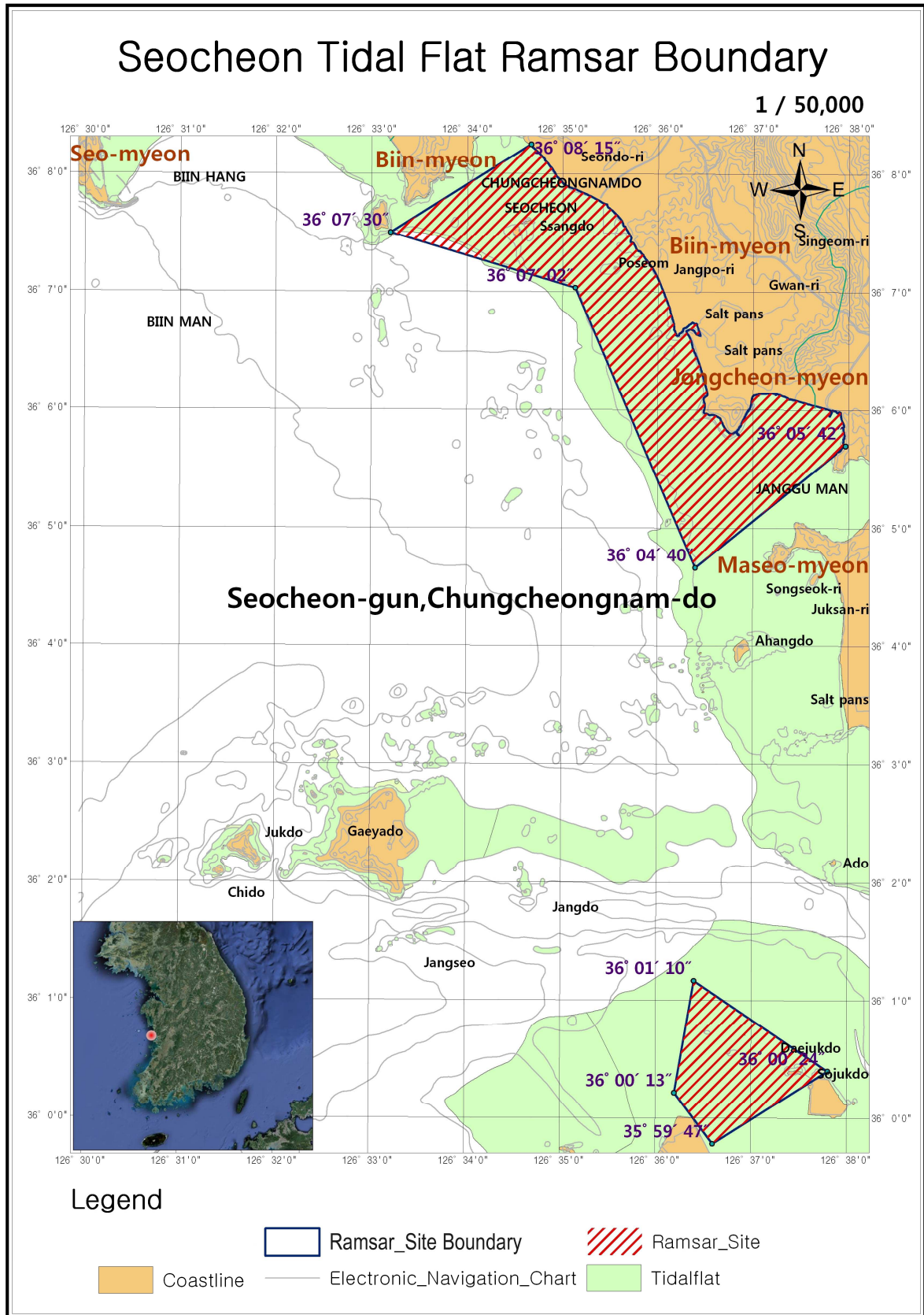


Figure 1. Seocheon Tidal Flat Ramsar Site

**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 is the same as the wetland protected area which designated by the Ministry of Land Transport and Maritime Affairs on January 30, 2008. The area of Seocheon Tidal Flat is approximately 15.3 km<sup>2</sup>. (WPA1 : 12.2 km<sup>2</sup>, WPA2 : 3.1 km<sup>2</sup>)

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**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.

36°00'00" - 36°08'54"N / 126°30'39" - 126°39'00"E (Fig. 1)

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**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 Seocheon Tidal Flat, located in the middle of the western coast of the Republic of Korea, is under the administrative jurisdiction of Seocheon-gun, Chungcheongnam-do, Korea. The coastal line of Seocheon-gun is about 84.7 km, extending over five eups and myeons of Janghang-eup, Maseo-myeon, Jongcheon-myeon, Beeyin-myeon, and Seo-myeon. The tidal flat expands from the Geum River estuary and is rich with a compound tidal flat where sand tidal flat or sand is dominantly scattered out. The area of tidal flat in Seocheon-gun is about 63.3 km<sup>2</sup>, which is the second largest area of tidal flat in Chungcheongnam-do (total area of tidal flat: 198.7km<sup>2</sup>).

Seocheon-gun adjoins large cities, such as Gunsan with a population of 300,000 and Boryoung of 100,000 people.

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

Average 4.0 m Mean Sea Level (Maximum 8.2m, Minimum 3.6m)

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

1,530 hectares (=15.3km<sup>2</sup>)

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

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

Located in the middle section of the western coast of the Republic of Korea, the Seocheon Tidal Flat is an open tidal flat directly linked to the outside sea. The deposits are composed of sand or a combination of sand and mud, providing habitat for a diverse group of marine life as well as a nursery ground. In addition, the Tidal Flat along with the Geum River estuary serves not only as a stopover point for many rare species of migratory birds, but plays important functions as a breeding ground and habitat for certain bird species. According to the survey conducted in the Geum River estuary and the surrounding areas of Yubudo (island) by the Ministry of Environment from February 2000 through January 2003, about 150,000 individuals of 98 bird species are observed. In addition, about 500,000 individuals of 69 bird species were recently observed from March 2008 to March 2009. In addition, the importance of the tidal flat ecosystem is further testified by the presence of 95 species of large benthic animals and 125 species of fish and marine life (Seocheon-gun, 2005).

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**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 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

#### 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: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.**

Inhabited by globally threatened species of Eurasian Spoonbill (*Platalea leucorodia*), Swan Goose (*Anser cygnoides*), Saunders' Gull (*Larus saundersi*), Spoon-billed sandpiper (*Eurynorhynchus pygmeus*), Spotted Greenshank (*Tringa guttifer*), Baikal teal (*Anas formosa*), Peregrine Falcon (*Falco peregrinus*) and Chinese Egret (*Egretta eulophotes*).

Common Name	Scientific Name	IUCN Status	CMS Appendix	National legislation	
				National Monument	Engangered
Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	II	Nº205-2	Level I
Swan Goose	<i>Anser cygnoides</i>	Vu	I/II	Nº325-1	Level II
Saunders' Gull	<i>Larus saundersi</i>	Vu	I		Level II
Spoon-billed sandpiper	<i>Eurynorhynchus pygmeus</i>	Cr	I/II		Level II
Spotted Greenshank	<i>Tringa guttifer</i>	En	I/II		Level I
Baikal teal	<i>Anas formosa</i>	Vu	I		Level II
Peregrine Falcon	<i>Falco peregrinus</i>	LC	-	Nº323-7	Level I
Chinese Egret	<i>Egretta eulophotes</i>	Vu	I	Nº361	Level I

\* LC : Least Concern, Vu : Vulnerable, En : Endangered, Cr : Critically Endangered (Birds on the IUCN Red List)

\* CMS Appendix I – Endangered migratory species; Appendix II - Migratory species conserved through Agreements.

■ **Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.**

The Geum River estuary and Yubudo (island) in the Seocheon Tidal Flat serve as important habitat for over 3,000 individuals of Eurasian Oystercatcher (*Haematopus ostralegus*), which is Level 2 threatened species of Korea. Accounting for over 30% of the surviving subspecies in East Asia, they spend the winter or breed here.

■ **Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.**

□ One percent of the individuals in a population of Eurasian Oystercatcher (*Haematopus ostralegus longipes*) is about 1,500 individuals (Birdlife International, 2006), about 3,000 individuals of which breed and inhabit in the Seocheon Tidal Flat, including the Geum River estuary.

■ **Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.**

□ Ninety-five species of macro benthic animals, 125 species of fish and marine life such as River puffer (Hwang-bok, *Takifugu obscurus*), Mullet (Gasungeo, *Mugil haematocheilus*), Korean rock fish (Hwanghaebollak), and Japanese eel (Baemjangeo, *Anguilla japonica*) are found to inhabit the Seocheon Tidal Flat (Seocheon-gun, 2005). Most of fishes have spawning and nursery grounds in the shallow intertidal flats and some anadromous species such as River puffer and Japanese eel migrates near Guem River estuary and spawns in upper fresh water streams. The tidal flat ecosystem is very important as spawning and nursery ground for the fish. It also provides important sources of food for migratory birds.

**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:**

TEMPERATE NORTHERN PACIFIC  
(Cold Temperate Northwest Pacific)

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

Yellow Sea.

LME. 2006. Large Marine Ecosystems: information portal. (1 December 2006; <http://www.lme.noaa.gov/Portal/>)

**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.

□ The Seocheon Tidal Flat in the middle of the western coast of Korea is an open tidal flat formed between Gunsan in Jeollabuk-do and Boryeong in Chungcheongnam-do. The tidal flat extends along 84.7 km of the costal line and expands 63.3 km<sup>2</sup>

□ The deposits in the Seocheon Tidal Flat are composed of sand, silt, and muddy sand, although it is covered predominantly by sand or muddy sand overall. In the tidal flat of Yubudo in Seocheon-gun, sand accounts for over 85% of the composition, while the tidal flat near Beeyin-myeon is composed of 40 – 73% of silt. The volume of clay is quite low at 5.7% on the average (Seocheon-gun, 2005).

- Origin: natural
- Deposits: sand, muddy sand
- Water depth: less than 10 m
- Tidal variation: 8.4 m at maximum
- Speed of tidal current: 10.2 – 66.9 cm/s (flood tide), 10.2 – 56.6 cm/s (ebb tide)
- Permanence of water: impermanent water quality by tidal cycles
- Water quality: see Table 1 of Annex.

The temperature in surface seawater fluctuates from 6.1 to 24.9°C with a monthly average of 15.4°C. Salinity in surface seawater ranges from 2.29 to 3.17 ‰, with its average at 2.9‰. The average of pH is about 7.96, and the average of dissolved oxygen is 9.21mg/L. The average of chemical oxygen demand and suspended solid is 1.92mg/L and 17.6mg/L, respectively (National Fisheries Research and Development Institute, 2008).

- Climate: see Table 2 and Figures 1 & 2 of Annex.

In the past 30 years, the average annual temperature in the areas of the Seocheon Tidal Flat recorded at

18.9°C, with the lowest at 3.6°C in January and highest at 29.6°C in August. The annual precipitation is

about 1,200 mm, and 60% of it is concentrated in the summer seasons from July through September.

The monthly average precipitation is about 100 mm, humidity averages at 75.4%, and the average of wind velocity is 3.9 m/s (The Korea Meteorological Administration, 2008).

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### 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 Geum River estuary where the Seocheon Tidal Flat lies is one of the most representative estuarine ecosystems of Korea, where freshwater from the Geum River water system joins and dilutes the seawater in the western sea of Korea. Originating from Jangsu-gun, Jeollabuk-do, the Geum River flows into the borders of Gunsan, Jeollabuk-do and Seocheon, Chungcheongnam-do in the total length of 394 km. The total size of the river amounts to 9,912 km<sup>2</sup>, rendering it the third largest river in the Korean Peninsula. The River streams through incised meanders at its upper current, and at the lower current is drowned valley. The geological features mostly include Daebo Granite. At the lower part of the River are found alluvial layers that were formed about 10,000 years ago.

- With its location in the middle of the Korean Peninsula, it has temperate climate with an average temperature of 11.0 to 12.5°C. The annual precipitation is about 1,100 – 1,300 mm and most of it is concentrated in the summer rainfall.

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### 18. Hydrological values:

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

The Seocheon Tidal Flat is located between the Geum River estuary and Boryeong. Extending along the coastal line, the Tidal Flat is rich with well-developed natural salt marsh and coastal sand dune. The deposits are predominantly composed of sand or muddy sand, and such composition is highly effective in facilitating rains to seep through the underground and form subsurface water during the heavy rainfall in the monsoon climate, thereby preventing flood. The wide expanse of the Tidal Flat not only protects the coast from typhoon, waves, and other outside forces, but slows down the tidal current (the current speed at flood-ebb tides is less than 0.5 knot), which performs an important function of moving deposits introduced from the Geum River to form deposits near the Seocheon Tidal Flat.

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### 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: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

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

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

**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.

G : Intertidal flat (Sand and muddy sandy)

**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.

Ecosystem service

- The Seocheon Tidal Flat is integral in providing habitation for marine life and birds. 95 species of macro benthic animals were collected from the Tidal Flat, and polychaetes kinds of the annelids phylum were most popular with 43 species present, followed by 24 species of crustaceans and 19 species of molluscs. These species are mostly tubicole, dwelling, burrowing species. Among benthic animal, bivalve molusca as like *Solen strictus*, *Phacosoma japonicus*, *Maetra veneriformis* provides also to human for valuable food. The Seocheon Tidal Flat is home to diverse groups of organisms ranging from benthic life to birds at the highest level of consumption, forming a stable ecosystem.

Economic value

- The sediments in this flat consist of sand and/or muddy sand facies, which is highly effective in flood control by infiltrating the precipitation and seeping the groundwater through seawater-sediment interface during the heavy raining season. In addition, this flat not only protects the coastline from various outside forces such as typhoon, wave, tidal current, but also purifies the pollutant (nutrient and metallic elements etc.) discharged from fertilizers and sewage near Seocheon Tidal Flat.

**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.*

Being on the coast adjoining the land, the Tidal Flat is diversely populated with halophytes and sand dune plants characteristic of the sediment on the upper part of the Tidal Flat toward the land. Reportedly, there are 45 taxa consisting of 17 families, 33 genera, 33 species and 1 variety (Seocheon-gun, 2005). In the sand dune area, typical sand dune vegetation has been developed: *Ischaemum antheboroides* (Gaetsoebori) is dominant and roundleaf chastetree (Sunbiginamu, *Virtex rotundifolia*), *Elymus mollis* (Gaetgeuryeong), *Carex pumila* (Jomborisacho), *Carex kobomugi* (Tongborisacho), field gromwell (Gaejichi, *Lithospermum arvense*), and *Messerschmidia sibirica* (Moraejichi) are well developed while protecting sand dune system. In the coastal area, salt marsh vegetation is developed such as chinese lowngrass (Gaetjandi, *Zoysia sinica*), *Suaeda glauca* (Namunjae), *Suaeda japonica* (Chilmyeoncho) and reed (Galdae, *Phragmites communis*). The above-mentioned area where halophytes are developed provides habitat to benthic life and Saunders' gull (*Larus saundersi*), an IUCN Vulnerable species

The colony of Pine tree (*Pinus thunbergii* community) is scattered along the coastal line of Sondo-ri, Beeyin-myeon and this helps to increase habitat diversity. In the Janghang-ri, Janghang-eup area, seagrass community (*Zostera* spp.) plays an important role to maintain coastal ecosystem providing spawning and nursery ground of oceanic life and purifying pollutants. And some *Suaeda malacosperma* (Gisucho,



unrecorded species in Republic of Korea) usually appearing in the brackish water zone are found in the Geum River Estuary.

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## 22. Noteworthy fauna:

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., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The Seocheon Tidal Flat serves as a stopover site for rare migratory birds such as Eurasian Oystercatcher (*Haematopus ostralegus*), Eurasian Spoonbill (*Platalea leucorodia*), Swan Goose (*Anser cygnoides*), Sanders's Gull (*Larus saundersi*), Spoon-billed sandpiper (*Euryornhynchus pygmeus*), Chinese Egret (*Egretta eulophotes*) as well as a habitat for Mallards (*Anas platyrhynchos*), Great Knot (*Calidris tenuirostris*), Spot-billed Duck (*Anas poecilorhyncha*), White Fronted Goose (*Anser albifrons*), and Common Kestrel (*Falco tinnunculus*). The diverse population of living organisms on the Tidal Flat, such as polychaeta including *Capitellidae*, crustaceans including ghost shrimp (Ssok, *Upogebia major*), *Macrophthalmus japonicus* (Chilgae), and sand-bubbler crab (Yeopnanggae, *Scopimera globosa*), and molluscs including Yellow Sea button top shell (Seohaebidangodung, *Umbonium thomasi*), Japanese clam (Gaeryangjogae, *Macra chinensis*), and short necked clam (Bajirak, *Ruditapes philippinarum*) provide important sources of food for the water birds.

In particular, some of the noteworthy inhabitants are Japanese eel (Baemjangeo, *Anguilla japonica*) and sweet fish (Eueneo, *Plecoglossus altivelis*) which taking advantage of the estuarine environment move back and forth between the fresh water and sea water, as well as other inhabiting fish include blue scaled herring (Baendaengji, *Harengula zymasi*), dotted gizzard shad (Jeoneo, *Konosirus punctatus*), and mullet (Gasungeo, *Mugil haematocheilus*). The avian population in the Tidal Flat include Mallards (*Anas platyrhynchos*), Great Knot (*Calidris tenuirostris*), Spot-billed Duck (*Anas poecilorhyncha*), Eurasian Oystercatcher (*Haematopus ostralegus*), and Eurasian Spoonbill (*Platalea leucorodia*), among 150,000 birds of 98 species.

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## 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 socio-economic values:

- The tide falling over the horizon of the west coast at the sunset provides beautiful scenery on the Seocheon Tidal Flat.
- The wide expanse, natural salt marsh and the rich population of marine life inhabiting the Tidal Flat provide great opportunities for people to learn about wetland and the ecology of a fishing village.
- Most fishers in the Seocheon Tidal Flat area take advantage of the farming tracts and paddy fields in the nearby land, engaging in both farming and fishing for living.
- Various type of marine products are caught throughout different seasons in the Seocheon Tidal Flat, including shellfish such as Short necked clam (Bajirak, *Ruditapes philippinarum*), surf clam (Dongjuk, *Macra veneriformis*), and *Solen strictus* (Matjogae); sea algae such as laver (Gim, *Porphyra tenera*), green alga (Parae, Enteromorpha), and seaweed fulvescens (Maesaengi, *Capsosiphon fulvescens*); molluscs such as *Octopus variabilis* (Nakji), webfoot octopus/short arm octopus (Jjookkumi), cuttlefish (Gabojingeo); and crustaceans such as Korean shrimp (Dae-ha, *Penaeus chinensis*), blue crab (Ggot-ge, *Portunus trituberculatus*), and mantis shrimp (Gaetgajae, *Squilla oratoria*). The total volume of the catch in 2004 was reported to be 7,238 tons, equivalent to 39.7 billion won.

**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?

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:

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**24. Land tenure/ownership:**

a) within the Ramsar site:

Ministry of Land, Transport and Maritime Affairs

b) in the surrounding area:

Seocheon-gun (county) and private owners

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

a) within the Ramsar site:

- The total population living in one eup, 4 myeons, and 17 ris in the vicinity of the Seocheon Tidal Flat was reported to be 11,849 in 2004, and 7.1% (1,655) of them are engaged in bare-hand fishing on the Tidal Flat.

- Most of the residents are farmers. Fish farming is dominant on the Tidal Flat, such as shellfish and sea algae (sea mustard, etc.).

b) in the surroundings/catchment:

- Of the total land area of 35,800 ha in Seocheon-gun, 41.5% (14,870 ha) is forestry. The rest consists of farming tracts and paddy fields. In 2007, the farm land used per household was 135 ha of paddy field and 33 ha of field. In addition, there are 1887 hectares of agriculture-protected area and 10,378 ha of agriculture promotion area.

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**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:

Although lack of easy access and no adequate facility of convenience attracted little tourism to the area before the West Coast Highway was laid out, it is now visited by many out-of-town visitors. The increase in tourism has resulted in indiscriminate offerings of tidal-flat experience programs, extraction of living organisms from the tidal flat as well as increased pollution in the surrounding areas. Thus, such increased activities in the area likely destroy the tidal flat, calling for a systematic use of the coastal tidal flat and management for the conservation.

b) in the surrounding area:

- Sedimentation of fine particles occurs frequently in the tidal flat and sandbar due to Geum River Dam, resulting in changes in the size of the tidal flat.

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**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.

- The Ministry of Land, Transport and Maritime Affairs designated the Seocheon Tidal Flat as a wetland protected area on January 30, 2008 in recognition of its function as a stopover and habitat for internationally important Eurasian Spoonbill (*Platalea leucorodia*), Swan Goose (*Anser cygnoides*), and other rare migratory birds, as well as the need to protect the strong presence of biodiversity.

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?:

- Subsidies are being provided for cleaning of fishing ground, discharge of seeds, and scattering of spat in order to preserve and maintain sustainable use of the tidal flat ecosystem.

- Conservation Plan for the Wetland Protected Area of the Seocheon Tidal Flat was established (Ministry of Land, Transport and Maritime Affairs, 2008).

d) Describe any other current management practices:

- In Seocheon Tidal Flat, the various fishing activities such as angling, fish and shellfish farms are allowed for those local residents with limited fishing license only.

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

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

- A research on establishing a conservation plan for the wetland protected area of the Seocheon Tidal Flat is currently underway (Ministry of Land, Transport and Maritime Affairs, 2008 - 2009), and adequate management will follow reflecting the conservation plan.

- A national institute of marine resources is planned to be built in Seocheon-gun. Plans are underway to set up a booth for publicity of the wetland protected area of the Seocheon Tidal Flat.

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

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

- Seocheon-gun undertook a survey of the ecosystem on the wetland protected area of the Seocheon Tidal Flat and the overall state of the local society and culture in order to find out about the current state of water birds, large benthic animals, plants, topography, and landscape of the wetland protected area and about the opinions and wishes of local residents regarding the wetland protected area.

- The program for citizens' monitoring of the Seocheon Tidal Flat is currently underway (Ministry of Land, Transport and Maritime Affairs).

- A project is underway to build ecology visit trails on the coastal line of Seocheon (Ministry of Land, Transport and Maritime Affairs).
- A project is underway to remodel the Tidal Centre Visitors' Centre.

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**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.

- The communication, education and public awareness programs like below are conducted by Seocheon-gun
- Experience program for tidal flat ecosystem including benthic organisms and sea bird
- Monitoring program for wetland ecosystem research
- Education program for tidal flat conservation

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**31. Current recreation and tourism:**

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

- Tidal flat experience program, fishing in tidal variation, seaweed extraction and processing experience
- Eco-tourism of fishing villages and rural areas
- Film and drama shooting locations
- Falling tide at the beach
- Beeyin and Chunjangdae beaches in Seocheon-gun
- Distribution of tour booklets for visitors at Seocheon-gun and tourism information centre.

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**32. Jurisdiction:**

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

Seocheon-gun (county), Chungcheongnam-do (province)

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**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.

Management jurisdiction: Chungcheongnam-do, Seocheon-gun

- LEE, Ki-hong
- Title: Director of Fisheries and Ocean Division
- Address: 356-3 Gunsari, Seocheon-eup, Seocheon-gun, Chungcheongnam-do, Republic of Korea
- Telephone: +82-41-950-4440
- Fax: +82-41-950-4456

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**34. Bibliographical references:**

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

- Seocheon-gun, 2005. Survey of the Tidal Flat Ecology for the Protection of Seocheon-gun Wetland, pp. 245.
- Birdlife International, 2001. Threatened Birds of Asia-The Bird International Red Data Book, pp. 127.
- Ministry of Maritimes Affairs and Fisheries, 2003. Survey of the Ecosystem and Research on the Sustainable Use of the Tidal Flat, pp. 1130.
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- National Fisheries Research and Development Institute, 2008. Annual Survey on the Marine Environment, pp. 408.
- Korea Meteorological Administration, 2008. Weather Report.
- Marine Survey Institute, 2000. Tidal Current Chart.

Ministry of Environment & National Institute of Biological Resources, 2009. Wintering birds census. pp.612.

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Ministry of Land, Transport and Maritime Affairs, 2008. Research on establishing a conservation plan for the wetland protected area of the Seocheon Tidal Flat.

Ministry of Land, Transport and Maritime Affairs, 2009. Seocheon Tidal Flat Conservation Plan. pp 166.

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## Annex

**Table 1. Water permanence: impermanent water quality (National Fisheries Research and Development Institute, 2008)**

	Temp. (°C)	Sal.(psu)	pH	DO (mg/L)	COD (mg/L)	SS (mg/L)
Mean	15.5	29.1	7.96	9.21	1.92	17.6
Max.	24.9	31.7	8.36	10.56	2.21	32.2
Min.	6.1	22.9	7.59	7.54	1.51	7.1

**Table 2. General climate (The Korea Meteorological Administration, 2008)**

	Temperature (°C)	Humidity (%)	Precipitation (mm)	Mean Wind velocity (m/s)	Daylight hours (h)	Snowfall (cm)
Mean	13.3	75.7	75.1	2.2	6.2	0.13
Max.	34.5	97.3	85.5	7.2	12.2	20.1
Min.	-9.7	38.5	0.0	0.6	0.0	0.0

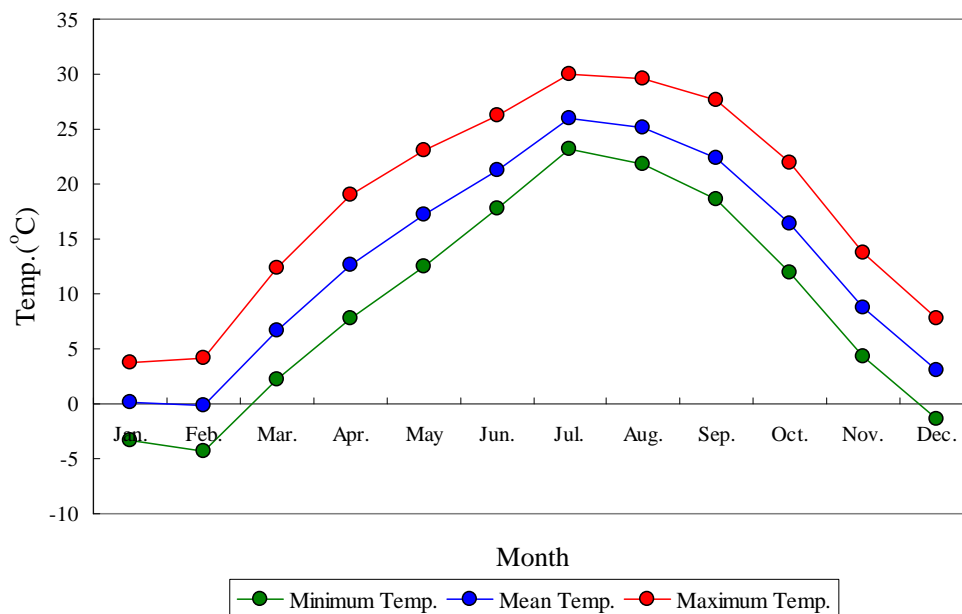


Figure 1. Monthly variation of average air temperature around Seocheon Tidal flat in 2008

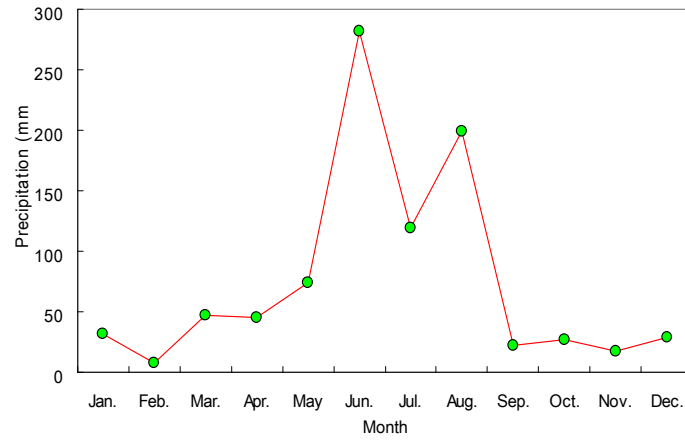


Figure 2. Monthly variation of precipitation around Seocheon Tidal flat in 2008