

Information Sheet on Ramsar Wetlands (RIS)

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Designation date Site Reference Number

2. Date this sheet was completed/updated:

29 November 2004

3. Country:

Republic of Korea (ROK)

4. Name of the Ramsar site:

Jangdo Island High Moor

5. Map of site included:

a) **hard copy** (required for inclusion of site in the Ramsar List): *yes* -or- *no*

Two maps attached: for Jangdo Island wetland and index map for the location

b) **digital (electronic) format** (optional): *yes* -or- *no*

6. Geographical coordinates (latitude/longitude)

N 34° 39' 37.4" - 34° 41' 59.4"

E 125° 21' 43.4" - 125° 24' 12.7"

7. General location:

- It is located at the top of Jangdo Island in Bi-ri, Huksan-myun, Shinan-gun (Council of the province) Chollanam-do, Republic of Korea.

- The Jangdo Island is a part of the Tadonhae-Haesang National Park, ROK.

8. Elevation:

230~267 meter asl.

9. Area

9.04144 hectares

10. Overview:

The Jangdo Island high moor is an island and natural mountainous wetland in the Republic of Korea, which is located in the marine island ecosystem about 100km from the Korean Peninsula. The Jangdo Island high moor is the only high moor on an island in Republic of Korea. The site is formed as a large piece on top of the island and also largest in unite area of high moor in ROK. This is unique as other high moor lands are composed of small separated pieces of moor lands.

The high moor is designated as a “National Wetland Conservation Area” on 31st of August 2004 by the Ministry of Environment. It has a few unique and important features. They are following:

The Jangdo Island high moor has a large scale of peat layers with clay layers underneath which can retain significant amount of freshwater. The quality of water in the high moor also records highest mark on the Water Quality Standard of ROK. This freshwater supports not only the plants and animals but also the people on the island.

There are 84 families, 209 genuses, 294 species found in the high moor. It represents the largest species concentration in terms of islands in ROK. The species in the Jangdo Island high moor are mostly tropical plants even though the island is not located in tropical area.

The Jangdo Island high moor supports species of which many of them are nationally listed as endangered species, e.g. *Falco peregrinus* and *Lutra lutra*. These species are considered as the natural monument by Protection of Cultural Properties Act and protected species by Environment Conservation Act.

In addition, various beautiful landforms and marine landscapes can be observed in and around the island.

11. Ramsar Criteria:

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8

12. Justification for the application of each Criterion listed in 11. above:

Criterion 1: The Jangdo Island high moor is the only high moor on an island in the Republic of Korea with the largest contiguous block of high moor located on top of the Jangdo Island. The island is divided into 5 areas, which are high moor, mountainous area at the back of the high moor, small scale streams, transferred zone and residential area.

Moreover, the high moor is an untamed natural wetland which is rare at present times given the increasing demand of human development. It is partly because the high moor is located far from the residential area, and most of the local people are performing fishing activities. The island itself is rather small and remotely located from the neighbouring island and mainland. The naturalness and unique characteristics of this high moor ecosystem partly explains the reason for national protection.

The Jangdo Island high moor has a unique geographical characteristic. The high moor has a large scale of peat layers. The range of the depth of peat layers is 70 cm – 80 cm which is significant by the international standard. Under the peat layers, the clay layers are placed. These two layers are important to retain and purify the water of high quality. This freshwater flow out of the high moor, and supports not only the plants and animals but also the people on the island as freshwater scarcity is apparent in typical islands of in the country.

Additionally, the mountainous area at the back of the high moor displays various landscapes such as well-developed saprolite cliffs. In contrast to the common climatic condition, tropical plants are diverse at the site.

Criterion 2: The following species have been observed in the Jangdo Island high moor that are listed as endangered or vulnerable nationally and globally. However, the survey on the number of the individual species has not been conducted yet.

The IUCN Red List

Endangered species: *Dendrobium minutiflorum*, *Zamia purpurea*

Vulnerable species: *Marsdenia robusta*, *Hobbesia cristatus*

Near Threatened: *Lutra lutra*

Ministry of Environment, ROK (excluding species mentioned above)

Endangered species: *Neofinetia falcate*, *Milvus migrans*, *Falco peregrinus*

Protected species: *Synthliboramphus antiquus*, *Columba janthina*, *Cuculus micropterus*, *C. canorus*, *C. poliocephalus*, *Saxicola torquata*, *Locustella pleskei*, *Ficedula zanthopygia*

Newly discovered species: *Hosta yingri*

Natural monument by Protection of Cultural Properties Act (excluding species mentioned above)

Accipiter soloensis, *A. gularis*

Rare and endangered species by Korean Association for Conservation of Nature (excluding species mentioned above)

Hynobius quelpartensis, *Scincella vandenburghi*, *Zamenis spinalis*, *Dinodon rufozonatus*.

Criterion 3: As mentioned above at Criterion 1, the Jangdo Island high moor has a unique geographical characteristic. Generally, the high moor with high quality fresh water provides habitats for most of the species on the island. The high moor is critical for those species because the island itself is not big enough to support all these species without the high moor. There are 84 families, 209 genera, 294 species found in the high moor. It represents the largest species concentration in terms of islands in ROK.

Most of the birds inhabit either in alpine wetlands or in the mountainous area at the back of the high moor. However, for their survival, fresh water is necessary which the high moor provides. Also, it was observed that they feed from the high moor. According to the first survey conducted from March to June in 2004, it was observed that the island may have been used by large number of migratory birds as a stopover or temporary habitat.

Because the survey has been conducted from March to June 2004, it is hard to find out which birds stay in the island for whole year and visit the island temporally. However, the number of birds observed in March hit the peak and the number gradually decreased. We could speculate that many birds stay only for stopover temporally. Further survey is necessary (Page 136, in *Ministry of Environment & National Institute of Environmental Research*, 2004).

Unfortunately, long-term survey to observe migratory birds has not been conducted on the island and the changes on the population of migratory birds are not available.

Animals broadly inhabit almost whole area of the island, as it is a major source of clean fresh water. Even though the island itself is fairly small (3.20 km²), local people used to graze animals before designating as a protected area. Furthermore, *Lutra lutra*, which needs clean water and appropriate food, has been found living near the high moor. It explains that the high moor sustains stable food web even for the large animals.

Many endangered plants are pushed to the cliff area of the island and remain only in small numbers. It is caused by human activities like collecting plants for commercial purpose and natural succession of plants. At present, only a couple of *Dendrobium minutiflorum* surviving at the cliff on the northwest side of island. The island supports other precious species such as *Ligularia stenocephala* and *Neofinetia falcate* which are narrowly distributed in a small area at the northern part of ROK.

13. Biogeography:

a) biogeographic region

Not known.

b) biogeographic regionalisation scheme

Not known.

14. Physical features of the site:

Geology and geomorphology

- Dadohea region including the Jangdo Island, which is South-western part of Korean peninsula, was formed by the large scale of crustal activity occurred about 80 million years ago and the climate change between the glacial and interglacial period in the geologic ear. During the fourth glacial period, the sea level rose up to 80 m to 140 m. The current Dadohea region was shaped 7,000 years ago after the last interglacial period.

- The main bedrock of this area is granite which has been deformed by the huge weathering processes since the Precambrian era.
- The landform of the Jangdo Island high moor is a meso-scale sinkhole type. The hill slope around the high moor is steep to flow the sediments and nutrients continuously to the high moor ecosystem.

Unique mixture of animals and plants

Even though the island formed in its present form 7,000 years back and located 100 km away from mainland, a few inland species such as *Lutra lutra* have been found on the island. This fact explains that the island was once connected to the mainland.

Climate

- Average annual rainfall: 1,316 mm
- Mean annual temperature: 13.76 °C
- Average temperature of the hottest month (August): 26.0 °C
- Average temperature of the coldest month (January): 1.0 °C

Soil type and sediment characteristics

The brownish-red peat layers were initially built up by the bedrock weathering and erosion processes throughout the geological period. This was further developed by the accumulation of rarely-decomposed plants owing to hydrologic conditions and micro-climate of the soil below surface layer. The bottom impermeable layer below the peat layers is composed of yellowish sediments that contain clay minerals leached out from the surface layer.

Water quality

- Water temperature: 15.9 °C (mean)
- Salinity: 0.07 psu (mean)
- pH: 7.28~7.42 (low alkali)
- DO (Dissolved Oxygen): 7.61~7.87 mg/l
- Water quality for drinking water: First grade

Downstream area

Rainwater from the high moor infiltrates into peat layers, and the infiltrated water flows as the groundwater. This groundwater finally flows out to the open sea as a waterfall.

(Appendix 3: photographs of The Jangdo Island)

15. Physical features of the catchments area:

Surface area

There are no waterways such as rivers in this area.

There is a small surface water flow through the hill slope from high moor to the open sea.

(Appendix 3: photographs of The Jangdo Island)

General soil types

Since the Jangdo Island is small (3.02 km²), same soil type mentioned above can be applied here.

General land use

Twenty years ago, this area was used as rice paddy fields. Currently, this area is not used for farming and being conserved for peat layers.

Climate

Average temperature of the coldest month (January) is around 1°C, which is higher than that of other area in Republic of Korea. Kuroshio warm current and the Yellow sea also provide warmer climate in winter. The island could create subtropical forest. However, because it is an isolated island and is affected by strong North-western seasonal wind, it represents various types of vegetation including subtropical and temperate zone vegetation.

16. Hydrological values:

- The water storage capacity of peat layers is excellent, and so the water supply to the Jangdo Island is as good as that of the inland district.
- High moor plays an important role in supplying water and improving water quality.
- Jangdo's residents can drink this water without artificial refining/filtering processes.

17. Wetland Types Inland:

a) Presence:

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

b) dominante:

The wetland type of The Jangdo Island high moor is inland wetland, which is located a few hundreds meters away from coastline and placed on top of the island.

Dominante types are:

Xp (Forested peatlands): Forested peatlands covers about 50 per cent of the high moor. Southwestern part of high moor, which is forested peatland, is mostly dominated by *Machius thunbergii* community, while Northern part of it is taken over by *Salix sp.* and *Camellia japonica*.

U (Non forested peatlands): Non forested peatland covers around 30 per cent of the high moor. *Percicaria thunbergii* and *Juncus effuses* communities are easily found all over the area.

(Appendix 4: Map of the dominant wetlands types)

18. General ecological features:

- It has many geologic information showing the formation and evolution of the Korean Peninsula and animal migration routes of the geologic era.
- It is a transitional zone between Southern eco-region's biome and Northern eco-region's biome in the Korean peninsula (2004, Ministry of Environment & National Institute of Environmental Research).
- It shows a very high biodiversity. Particularly, in most other islands in ROK, the number of plant community ranges from 8 to 10, however, that of Jangdo is 26, even though the size of the island one of the smallest islands in ROK.
Plant: 84 family 209 genus 294 species
Water insect: 13 order 16 family 20 species
Insect: 15 order 60 family 126 species
Reptile and amphibian: 5 species
Bird: 44 species
Mammal: 5 order 7 family 7 species
- The biome composition is widespread over the entire food chain. See above.
- The Jangdo Island high moor displays various ecosystems (high geo-diversity or habitat diversity) such as mountain ecosystem, hill slope ecosystem, small-scale freshwater ecosystem, and brackish water and marine ecosystems.
- The site covers non-forested peatlands, Alpine wetlands and Forested peatlands are mixed in this area. Forested peatlands covers about 50 per cent of the high moor. South western part of high moor, which is forested peatlands, is mostly dominated by *Machilus thunbergii* community, while Northern part of it is taken over by *Salix sp.* and *Camellia japonica*.
- Non-forested peatlands covers around 30 per cent of the high moor. However, it dominated the central part of high moor. *Persicaria thunbergii* and *Juncus effusus* communities are easily found all over the area.

19. Noteworthy flora:

According to the survey of 2003-2004:

Representative flora: *Sphagnum palustre*, *Drosera rotundifolia*, *Menyanthes trifoliata*, *Gentiana jamesii*, *Sanguisorba tenuifolia* var. *alba*, *Carex jaluensis*, bladderwort *Utricularia ochroleuca*, *Glyceria leptolepis*, rush *Juncus effusus* var. *decipiens*, *Lobelia sessilifolia* and *Trientalis europaea* var. *arctica*.

The rare plant species: *Viola biflora*, *Carex onoei*, *Clematis fusca* var. *coreana*, *Pleurospermum kamtschaticum*, *Galium trifidum*, *Lonicera coerula* var. *emphyllocalyx*, *Scabiosa mansenensis* for. *pinnata*, *Lobelia sessilifolia*, *Disporum ovale*, *Majanthemum bifolium*, *Trillium kamtschatium*, *Platantherum hologlottis* and *Pogonia japonica*.

Other noteworthy flora: *Hosta yingeri*, *Farfugium japonicum*, *Damnacanthus indicus*, *Machilus japonica*, *Litsea japonica* Juss, *Daphniphllum macropodum*, *Daphniphllum teijsmanni*, *Sedum spectabile*, *Dencorpanax morbierum* (These plants were marked over rank 3 and 4 out 5 by the ecological importance test, Data from 'A Report of Natural Ecosystem in Jangdo Island high moor' by Ministry of Environment & National Institute of Environmental Research, 2004)

20. Noteworthy fauna:

See Section 12, Criteria 2 & 3.

21. Social and cultural values:

- The peat layers of the Jangdo Island high moor has a very high capacity to store enough water to meet its water supply needs as much as the inland district needs. Until 1960s, the Jangdo Island used to provide fresh water for many other islands around because typical island does not have enough fresh water for supporting people on the islands.
- The Jangdo Island shows clear geographic features and cases than other islands or inland sites. The geologic information of Jangdo Island enables us to infer the formation and evolution of the Korean Peninsula and the North- Pangaea theory of the geologic era.

22. Land tenure/ownership:

(a) within the Ramsar site:

The Jangdo Island high moor is currently owned by local people and the Ministry of Finance and Economy, ROK. According to the government intra-report (Environmental Policy Department, Ministry of Environment, 2004), the National Park Authority plans to purchase the land under the Wetland Conservation Act with budget support from the Ministry of Environment.

Address	Size	Owner
Mountain 109-1	33,777	Three local people
Mountain 109-2	43,013	Three local people
Mountain 109-3	11,415	Ministry of Finance and Economy
	2,209	No owner specified
Total	90,414	

At the time of producing the RIS for the island, negotiation on price of the lands between private owners and MOE is in process. However, according to National Wetland Conservation Area by Wetland Conservation Act (31 August 2004, Ministry of Environment) and the National Park Act (23 December 1981, Ministry of Environment), no one is allowed to use this high moor for the purpose of one's private interest. Due to the Act, there has been no human activity on the privately owned land.

(b) in the surrounding area:

Most of the surrounding area is privately owned.

23. Current land (including water) use:

(a) within the Ramsar site:

The high moor is designated as a National Wetland Conservation Area on 31st of August 2004 by the Ministry of Environment and protected as a part of Dadohaehaesang National Park by the Ministry of Environment. The area is not used any other purpose but conservation wetland area.

(b) in the surrounding area:

The surrounding area is not protected by the National Wetland Conservation Area. However, it is still protected by the National Park Law by the Ministry of Environment. Construction and any other activities that might affect the environment of the island are strictly prohibited by the National Park Law.

The residential area is located on the coast which is the North-eastern part of the island and 400 meters away from the high moor. It could sound the high moor is very close to the residential area. However, the sea level difference is more than 150 meters and there is no proper pathway to the site. It is not easily accessible to the local people.

The main point for withdrawing water by communities is the end of the stream which is next to open sea. However, there is no official record about the amount of water used by local community.

24. 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:

The land used to be used as a grazing land for mainly goats. However, since the designation as a National Park and National Wetland Conservation Area, it has been left without any human activity. However, it is hard to predict there will be no future threat in any circumstances. Obviously, there has been government effort to use the island as an ecotourism. It might cause more or less of exposure to people and could result some form of degradation.

(b) in the surroundings/catchments:

Until now, this area is well conserved by the National Park Law and efforts from the residents of the island to protect their sources of water supply.

There has been no development project reported. However, after having been designated as a Wetland Conservation Area, the island has been proposed as an ecotourism site. It might cause the adverse effect on the site because of sudden increase of external tourists and other related impact for pollution.

25. Conservation measures taken:

National Wetland Conservation Area by Wetland Conservation Act (31 August 2004, Ministry of Environment)

Prior to this, Dadohaehaesang was designated as the National Park on 23 December 1981 by the Ministry of Environment.

Jangdo Island is one of 1,596 islands in the National Park. The island has been managed as a part of the National Park with legal enforcement limited ecologically threatening human activities. However, any particular management only for the Jangdo Island has not been established so far. The efforts mentioned above were volunteer activity by local people.

26. Conservation measures proposed but not yet implemented:

Posting sign boards, site patrolling and construction of a management facility has been planned in the government intra-report (Environmental Policy Department, Ministry of Environment, 2004), and the budget was approved. However, there has been no construction process apart from posting a sign board and site patrolling.

There have been also some unofficial discussions about the possibility of future ecotourism site inside the Ministry of Environment. However, it has not been shaped as a proper government project or policy yet.

27. Current scientific research and facilities:

Researches:

- Survey on the land ownership status on the Jangdo Island, MOE, (July 2004)
- A Report of Natural Ecosystem in Jangdo Island High Moor, Ministry of Environment and National Institute of Environmental Research (July 2004)
- Field Survey on the Jangdo island, Yeongsan River Basin Environmental Office (25 August 2003)
- Jangdo, New and Only Island High Moor, The Korean Association for Bird Protection (22 July 2003)

Facilities:

No facilities (until 25th of March 2005)

28. Current conservation education:

TV:

KBS ('I wish I were there', 15 Feb 2004): Introduction of The Jangdo Island mainly focused on the ecological side of the island.

SBS ('Water is Life', 19 Sep 2004): One hour long full documentary about The Jangdo Island from ecology to geography and geology as well as local people's life.*

Newspapers: Special section for the Jangdo Island on major newspapers including Chosun, Donga, Joongang, Hankyoreh and Yonhap News (30 Aug. 2004)

29. Current recreation and tourism:

After having been designated as a National Wetland Conservation Area by the Ministry of Environment, ROK on 31 August 2004, there have been some discussions about Eco-tourism project on the Jangdo Island. However, it has not been shaped as a proper government project or policy yet. Nevertheless, there was a plan for further progress on constructing visitor stands, bird observation stations, specimen halls etc. by the Environmental Policy Department of the Ministry of Environment in 2004. After having completed necessary researches: Environmental Impact Survey, Economic Evaluation etc., the plan would follow the existing examples such as Nakdong River basin and Han River facilities.

There is no official record of the number of visitors or their purpose of visit on the site.

* KBS and SBS are two of five biggest nation wide broadcasting companies. KBS is also the only government-owned broadcasting companies. Two programs mentioned above were broadcasted nation widely.

30. Jurisdiction:

The Chollanam-do (South Cholla Province) has its jurisdiction over the moor.

31. Management authority:

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