

DISCOVERING KOREA

Upo

WETLANDS

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The Upo wetlands in Changnyeong, Gyeongsangnam-do province is the largest natural wetland area in Korea. Upo, which was designated as Korea's most significant ecological preservation area, refers not only to the Upo wetlands itself, but a broader area that covers four separate wetlands—Upo, Mokpo, Sajipo and Jjokjibeol.

The Upo wetlands in Changnyeong, Gyeongsangnam-do province, make up the largest natural wetland area in Korea. The original Korean name for Upo was Sobeol. The name Upo derives from the name written in Chinese characters and was first used on a map during Japan's colonial rule of Korea (1910-1945). It is said that the name Sobeol is a combination of the Chinese character *so*, swamp, and the Korean word *beol*, plains, and to this day many of the local people still use Sobeol rather than Upo.

Upo, which was recently designated Korea's most significant ecological preservation area, refers not only to the Upo wetlands itself, but a broader area that covers four separate wetlands—Upo, Mokpo, Sajipo, and Jjokjibeol. The wetlands are located at the neck of a mountain to the north of the wetlands called Somoksan, "Cow's Neck Mountain." The village at the foot of the mountain is known as Somokmaeul, "Cow's Neck Village." Together, the four wetlands form an area 25 kilometers by 16 kilometers, the biggest natural wetlands area in Korea.

The wetlands of Ibang-myeon and Daehap-myeon were formed by the narrowing of some of the smaller streams flowing into the Nakdong River. Swampy lakes formed alongside the banks of the river from the boundary of Gyeongsangbuk-do, which is in the midstream area of the Nakdong River, between Changnyeong and Namji counties.

The Nakdong and Topyeongcheon rivers were formed with the emergence of eroded valleys during the Ice Age. In the late Ice Age, the down-



stream reach of the Topyeongcheon had a limited water-flow capacity which in times of heavy rainfall would cause a backwash. As a result, when the waters of the main Nakdong River impeded the flow of its Topyeongcheon tributary, the sediment carried by the Topyeongcheon accumulated downstream. Natural banks formed and the water trapped within these banks formed marshy lakes that became the wetlands now known as Upo, Mokpo, Sajipo and Jjokjibeol.

All the water of the Upo wetlands

comes from the Topyeongcheon, which is a significant body of water, and other surrounding rivers.

The Upo wetlands are noteworthy for several reasons. First, a wetland area is capable of retaining water while performing the functions of absorbing, releasing and storing water for various periods of time. As such, it provides an ideal habitat for fish and other aquatic creatures while maintaining a constant level of underground water. In times of flooding, when the waters of the Nakdong overflow, the water level of the Upo wetlands rises to



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A Upo fisherman rows his boat home after a day's catch (left).
A red dragonfly (top).
A catfish (above).
Frogbit plant (below).





over 5 meters in depth, thus serving as a natural reservoir, with a capacity of some 134 million cubic meters, which helps to control flood waters and provide water for irrigation.

Second, the chemical processes that take place within the wetlands are of vital significance. The amount of matter produced by the marsh plants of the Upo wetlands is approximately 2,767 dead-weight tons per annum, which is a higher average per unit area than any other region. The amount of nitrogen and phosphorus absorbed by the aquatic plants are estimated to reach 46,985 and 5,385 kilograms per year, respectively. As leaves and other organic matter decompose, they are spread through the wetlands while the chemicals produced through the eutrophication process, such as nitrate and phosphate, are absorbed by the plants.

Third, because of the richness of the plant matter, the wetlands are an excellent

habitat for animal life, thereby helping to ensure the diversity of the animal population. The water provides plenty of nutrition that enables the plants to flourish. Birds, fish and other animals gather around the plants, lay their eggs and rear their offspring there. Moreover, the wetlands play an essential role in the preservation and protection of the fish and shellfish as well as many kinds of freshwater plants living there.

In contrast to land animals, the creatures of the wetlands have nowhere else to go if the wetlands are destroyed. They would lose their natural habitat and be threatened with extinction. Studies have identified 1,772 types of flora and fauna that make their home in the Upo wetlands, including plants, freshwater fish, birds, insects, and invertebrates. The preservation of Upo is therefore critical for the survival of its diverse plant and animal life.

Studies indicate that there are a total of 435 different kinds of plants found at Upo, including 38 orders, 109 families, 288 genera, 375 breeds, and 1 sub-order, along with 62 varieties and 7 forms. The plants in Upo show a high level of diversity, accounting for some 50-60 percent of all plant types in Korea. This diversity of plant life is due to the consistent environment of the Upo, Mokpo, Sajjpo and Jjokjibeol wetlands and the Topyeongcheon, in addition to the diversity of the surrounding area which includes farmland and agricultural waterways, the comparatively moderate climate and the relatively unpolluted conditions.

Wild winter geese search for food in the wetlands (top).

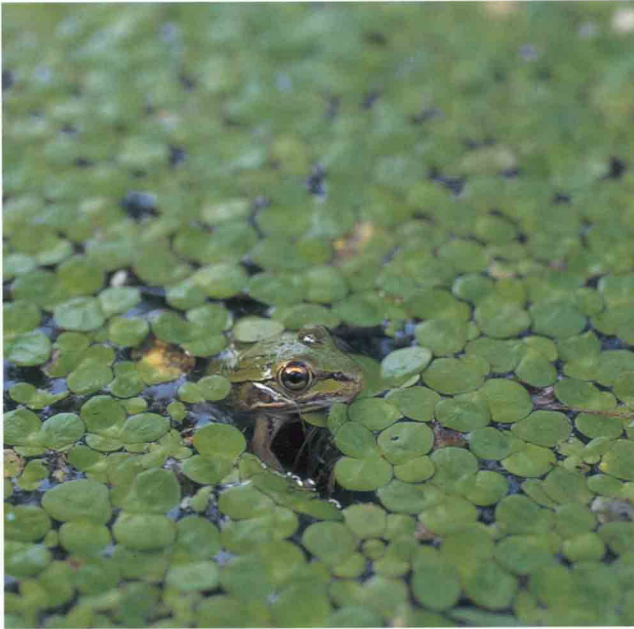
Wild winter ducks flock to the wetlands' shores (below).

Pond skaters (right, top).

A variety of floating leaves cover the waters (right, below).







The small cheonggaeguri (green frog), indigenous to Korea, can be found in the Upo wetlands.

The Upo wetlands are home to three kinds of plants listed on the Ministry of Environment's specially protected fauna and flora list. These include the thorny lotus whose leaves, 2 to 3 meters in diameter, are said by Korean scholars to be the biggest leaves of any plant in the country; the *hydronicus asiatica*, a kind of grass that grows in the wetlands; and a rare insect-eating plant that has been discovered in the area. In addition, 48 naturalized plants and 10 introduced plants have been identified, while the area where naturalized plants are growing is rapidly expanding.

The types of birds stopping by at Upo vary according to the season. As the north wind subsides and the warm spring breezes begin to blow, summer migratory birds such as moorhens, coots and

dabchicks can be seen making their nests among the reeds or on the water. From June to August as the foliage thickens, newly hatched spot-billed ducks learn to swim in the shallow water near the willows while baby pheasants form lines along the banks.

Adding to the charm of summer at Upo are the sounds of eastern great reed warblers as they venture among the reeds, yellow orioles singing beautifully at the top of their voices, cuckoos who lay their eggs in the nests of other birds and then linger around, and the crystalline sound of bluebirds.

As autumn comes around and the rice plants start bowing their heavy heads, the colors of Upo change to brown. The water level starts to subside and the land begins to show. This is when the spot-billed ducks, mallards, teal ducks, Australian curlews, snipes, and Kentish plovers gather at the wetlands while the flocks of ducks flying

down from the north grow noticeably larger every day.

Toward the end of autumn in October, flocks of geese form V-shaped patterns in the sky while flying in with other winter migratory birds such as mallards, Baikal teals and whooper swans.

Winter migratory birds are known to fly over 3,000 kilometers to Korea from Siberia and northern China. They survive a journey fraught with such dangers as gale-force winds, torrential rain, and attacks by natural predators including eagles to arrive in Korea without fail every year. The birds which spend their winter at Upo are mostly water birds, such as swans, ducks and geese. They come between November and January and then take off for the north in February and March: Bean geese and ducks come together from Siberia and northern Manchuria around mid-October while swans visit in November. Recently, the rare spoonbill has also been sighted at Upo.

In the wetlands convention adopted at Ramsar, Iran, in February 1972, wetlands are defined as "areas of marsh, fen, peatland, whether natural or artificial water, permanent or temporary, static or flowing, fresh, brackish or salt, including marine water the depth of which at low tide does not exceed 6 meters." The Ramsar Convention on Wetlands, which is the first international agreement in the world focused on the conservation and protection of the diversity of living creatures, was adopted after the International Conference on the Conservation of Wetlands and Waterfowl. It is a major international environmental treaty that is closely related to the Convention for Biological Diversity and the Convention on International Trade in Endangered Species (CITES).

The Upo wetlands were included under this treaty in 1998, thus providing an impetus for more effective use and preservation of the wetlands' ecology and enhancing the image of Korea overseas in terms of environmental diplomacy. ♦