Editorial note

Preliminary data for the national census of 13 January 1980, presented to the Symposium, gave 6797 *C. c. cygnus* and 1954 *C. c. bewickii.* A count of Hokkaido alone on 10 February 1980 gave 5129 *C. c. cygnus,* including 157 on Lake Utonai and 3520 on Notsuke Bay, which were to be visited on the excursions.

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PRESENT STATUS OF THE SWANS WINTERING IN KOREA AND THEIR CONSERVATION

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Introduction

Three species of swan migrate to Korea. They are *Cygnus cygnus cygnus, Cygnus columbianus bewickii* and *Cygnus olor.* The last is a rare winter visitor.

Before World War II, flocks of thousands of swans would winter in Korea and form magnificent spectacles. In early winter, they would arrive in large groups at ponds, lakes and reservoirs on the eastern and the western seashores in the north. When it became colder, they would move down to the south and winter on ponds and wetlands in Geongsang-namdo. Some would move further down to the southern islands, such as Jindo, when waters froze in the rest of the Korean peninsula. Thus, in the south swans began to appear in late October and would stay until they flew northward in late February and early March.

Before World War II, there were many abandoned wetlands which attracted swans in Korea. Among them, Hyopcheon and Changnyong inland areas and Jindo seashore areas were designated and preserved as Natural Monuments, on Professor Tamezo Mori's proposal, from 1934 to 1945. Since then, the wetlands and marshes in these areas have become farm fields. Accordingly, Hyopcheon and Changnyong were released from being Natural Monuments in 1973, and before long Jindo will face a similar situation (see Fig 1).

Causes of wildlife decline in Korea

After World War II, wildlife in Korea met its disaster during the period of the

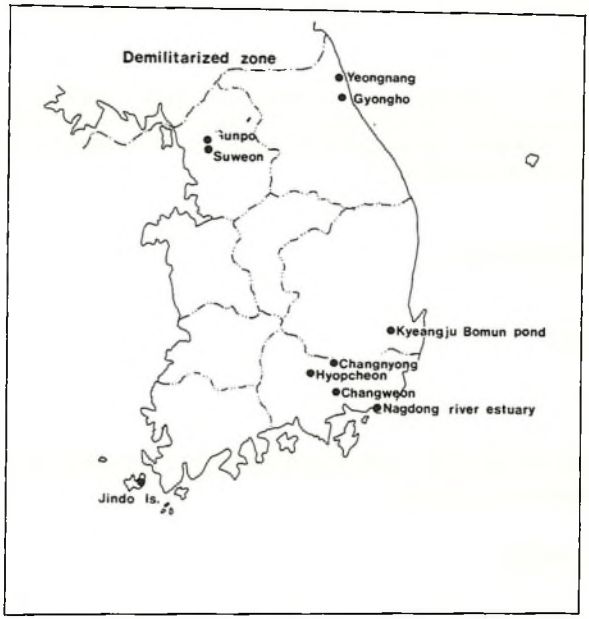

Fig 1. Wintering grounds of swans in Korea 1960–1970.

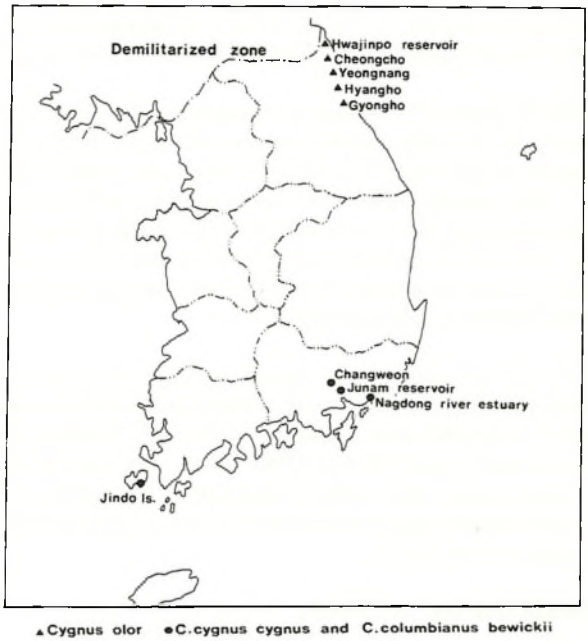

Fig 2. Wintering grounds of swans in Korea 1970–1980.

Korean War, 1950 to 1953, and in the period of social disorder which followed. Soldiers and even civilians illegally hunted wildlife with shotguns, traps and poisons so as to sell it to fur and taxidermy shops. As a result, wildlife greatly decreased and some species faced the danger of extinction.

Since then, the Government planned farm expansion in the 1960s largely by the reclamation of seashore wetlands and inland water, and gave a deadly trial to waterfowl and waders by destroying their habitats. Furthermore, the indiscriminate use of chemical fertilizer and all kinds of insecticide for agriculture has brought about an environmental pollution which allows hardly any wildlife to survive. Again, the recent speedy development of modern industrialism has transformed many inland and seashore areas into sites of mammoth factories with chimneys and pipes pumping out smoke and sewage. These and other human disturbances, such as noise from automobiles and aeroplanes, threaten wildlife virtually everywhere.

Present wintering grounds of swans in Korea

In the Nagdong Delta about 2000 to 3000 *C. c. cygnus* and *C. columbianus bewickii* winter annually. Less than 200 swans winter on the Jindo seashore and on Dunjeon Reservoir on that island. About 260 to 370 swans migrate to Junam Reservoir (210 ha) in Gyeongnam Province and a lesser number arrive at Samnam Reservoir (70 ha) nearby.

On some ponds, streams and newly made reservoirs, several wintering swans, and sometimes up to ten, may be seen. At times, a similar number of wintering swans may be seen on certain southern islands, but none is observed on the western seashore. Some *C. olor* alone winter on lakes on the eastern seashore (see Fig 2).

Wintering grounds of *C. olor*

Before World War II, there were only three records in Korea. Kalinowski collected a young female at Wonsan on 27 February 1888. Then Kuroda reported one from Mogpo, Jeolla-namdo, in January 1916. Finally, Mori collected one in Chungnam Province on 13 December 1918.

After World War II, several new wintering grounds were discovered. On 8 January 1968, 24 *C. olor,* including 4 young, were observed on Gyongho Pond at Gyongpodae, Gangneung in Gangweon-do. On 21 February 1974, 8 and on 22–23 January 1977, 12, including 4 young, were observed on Cheongcho Pond near Sokcho in Gangweon-do. Recently, the author was fortunate enough to discover some 145 wintering on Hwajinpo Reservoir near Geojin, Goseong-gun in Gangweon-do, on 8 January 1980. This must be the largest group of wintering *C. olor* ever recorded in Korea. Hwajinpo Reservoir (202 ha), which was built for agricultural water supply and which overflows into the sea, is one of the least polluted reservoirs.

The distance between Hwajinpo and Gyongho Pond is about 112 km, and there are in between several large and small ponds and small patches of wetland, such as Songjiho Pond (63 ha), Bongpo Pond (10 ha), Yeongnang Pond (101 ha), a piece of wetland near Wolpo seashore in Yangyang (about 20 ha), Maeho Pond (19 ha), Hyangho Pond (104 ha), Cheongcho Pond near Sokcho (135 ha) and Gyongho Pond (99 ha). To these ponds and a wetland, about 250 to 300 swans, including 145 *C. olor,* seem to make regular visits from late October to early March.

These ponds and wetlands with brackish water seem to be the only wintering grounds of *C. olor* and their proper conservation should be established immediately.

The wintering grounds of swans at Nagdong Delta

Nagdong River has a large estuary and a number of deltas which fall under the jurisdiction of the city of Pusan. On the upper estuary there are islets such as Hadan-do and Eulsug-do, and between the main stream of Nagdong River and Jugrim River a huge delta is formed.

Migrants gather and search for food around the ever-changing tidal spits on the mudflats in front of the Nagdong Estuary as there are plenty of aquatic plants and invertebrates at low tide. These huge wetlands become the sanctuary of waterfowl in Korea. In spring and autumn, large flocks of waders stop here. In winter, this area becomes the haunt of ducks, geese, swans, gulls and cormorants. Even in a severe winter when water is frozen in central Korea, the Nagdong Delta usually remains open. Sometimes even Natural Monuments, such as *Grus vipio, Platalea minor,* eagles and vultures, may be seen among the species wintering there and, at times, rare species, such as *Glareola maldivarum* and *Eurynorhynchus pygmaeus,* may be observed. From these areas of the Nagdong Delta, a total of 136 species of bird have so far been recorded, most of the waterfowl, waders and birds of prey hitherto observed in Korea.

Recently, however, the species and the numbers of birds that migrate to the Nagdong Delta have decreased remarkably year by year. This is primarily due to the waste discharged from nearby manufacturing plants into the tributaries of the river and the insecticides widely spread for agricultural use on adjacent areas.

The Office of Forestry prohibited hunting in those areas of the Nagdong River as of 31 October 1962, and the Bureau of Culture Property Preservation designated those areas as a Natural Monument as of 13 July 1966, and the three swan species were designated by the Government as Natural Monument No 201 on 30 May 1968.

General

In Korea, only three wetlands have been preserved as Natural Monuments, being designated by the Government for migrating birds. They are the estuaries of the