

# Preserving Biodiversity in Korea's Demilitarized Zone

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Amidst international tensions and military posturing, the Demilitarized Zone (DMZ) separating North and South Korea has, for 45 years, provided sanctuary to endangered and threatened animals and plants. The DMZ has been rigidly enforced: It is uninhabited by humans, and its inaccessibility has allowed damaged forests to rehabilitate and farmlands that are thousands of years old to return to a natural state (1). The DMZ has, in fact, become a unique nature reserve containing the last vestiges of Korea's natural heritage. The Korean Peace Bioreserves System (KPBRs) (2) provides a strategy to preserve the rich biodiversity of the DMZ. Joint development of the KPBRs will foster trust, understanding, and respect between the Democratic People's Republic of Korea (DPRK) in the north and the Republic of Korea (ROK) in the south.

## Environmental Degradation

The Korean peninsula is no longer the "Keum-Su-Kang-San" (land of embroidered rivers and mountains), a historical icon and source of pride for Koreans that reflects the beauty of Korea's landscapes. For the past three decades, the integrity of Korea's ecosystems and landscapes has been systematically compromised (3, 4). In South Korea, most natural ecosystems, including large sections of the coastline and salt marshes, have been converted into industrial estates and urban centers. This development has resulted in severe pollution of waterways and farmlands by pesticides, chemical fertilizers, and industrial and municipal waste (3, 4) and in massive habitat destruction and fragmentation. In North Korea, rampant deforestation has caused severe soil erosion and flooding, along with environmental degradation by military operations.

The result has been a loss of biodiversity. The 1994 biodiversity study in South Korea (3) revealed that 14% of known birds, 23% of freshwater fishes, 29% of mammals, 48% of reptiles, and 60% of amphibians were endangered or extirpated. The problem is compounded by our meager knowledge of Korean biodiversity; for example, less than one-third of insect fauna is well described

(3). Because the human population of the peninsula may reach 100 million by the year 2025, continued economic development will require additional appropriation of lands and natural resources, intensifying the loss of biodiversity and heightening the environmental degradation (2, 3). Consequently, economic and cultural development will eventually be compromised.

## Preserving Biodiversity

The DMZ, defined along the Military Demarcation Line established by the 1953 Armistice Agreement, is a 4-km-wide, 250-km-long corridor extending across the peninsula. It traverses a major river delta and old farmlands in the west and rugged mountains in the east (Fig. 1). On both sides, the corridor is heavily fortified, with land mines and barbed wire fences in the buffer zones.

The DMZ ecosystems and landscapes represent a cross section of the Korean peninsula, with central and western lowlands divided from the eastern highlands by the Taebaek-san Mountains and adjacent north-south mountain ranges. Biotic surveys conducted for the last 30 years in the Civilian Control Zone (CCZ), the 5- to 20-km-wide buffer zone occupying 1529 km<sup>2</sup> in South Korea, have revealed many

plants and animals that were considered extirpated, endangered, or threatened and have also recorded many previously unknown or endemic species (1). The CCZ flora includes 1170 vascular plants and the waterways support 83 fish species, including 18 endemic species (1). The DMZ and CCZ ecosystems provide wintering grounds for two of the world's most endangered birds: the white-naped crane (*Grus vipio*) and the red-crowned crane (*G. japonensis*) (1), and numerous other endangered birds make their homes here. The CCZ mammal fauna consists of 51 species, which represent 67% of Korean fauna (1, 3). Nine rare species of mammals inhabit the CCZ, including the black bear (*Selenarctos thibetanus ussuricus*) and the musk deer (*Moschus moschiferus caudatus*). Although the DMZ biodiversity cannot be directly assessed at present, the CCZ biota provides a glimpse of what may be expected within the DMZ itself.

Preservation of the biota of the DMZ and adjacent natural areas in buffer zones is fundamental to the development of a successful strategy for nature conservation. The conservation strategy should begin with the establishment of a system of biodiversity reserves with legal means of limiting human use (5). I have proposed the KPBRs as a means to preserve the DMZ's biodiversity and ecosystems (2, 5).

## Transboundary Reserves

Unlike other potential transboundary reserve sites, the Korean DMZ corridor belongs to neither party and is already well defined and controlled by the Military Armistice Commission. It is completely pro-

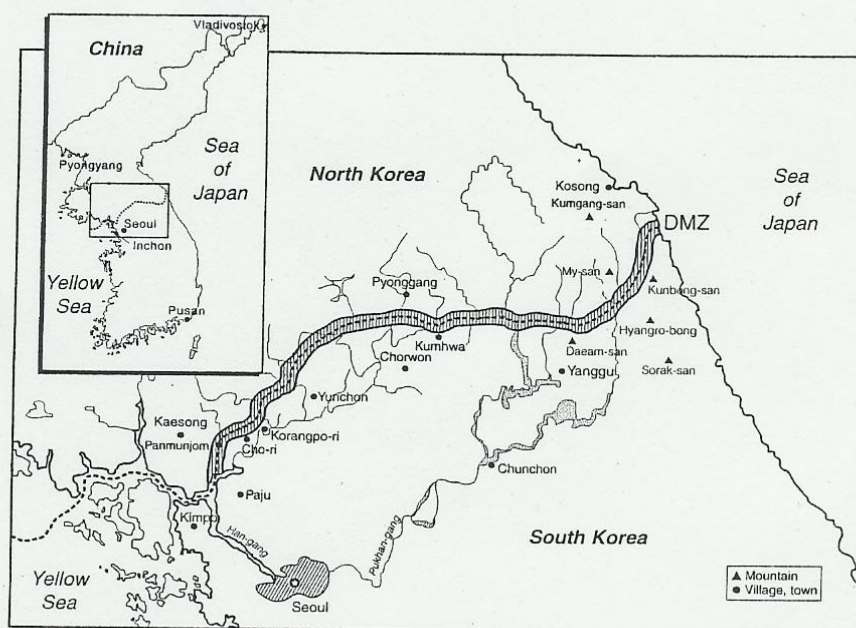


Fig. 1. Map of the DMZ and surrounding areas.

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tected, clearly delimited, and demilitarized between two borders—it is a ready-made nature reserve.

The 1991 bilateral agreement between the DPRK and the ROK affirmed the use of the DMZ for peaceful purposes (6). As I envisage it, the KPBRs would be a system of transboundary reserves jointly administered by the two Koreas (2, 5). In principle, the KPBRs should occupy the entire DMZ corridor and all related habitats in the adjacent buffer zones on both sides. (It may be ambitious to include the buffer zones in the first phase of the KPBRs development, because they are not jointly controlled.) Because the DMZ corridor contains a diversity of landforms and of climatic, geological, and physiographic zones, the KPBRs should include different classes of protected areas, including (i) nature reserves strictly for long-term research; (ii) protected landscapes or seascapes, including international parks for natural heritage conservation and ecotourism; and (iii) experimental villages (farming or fishing) with a limited number of families from North and South Korea living together in an environmentally friendly manner (2).

The KPBRs provides a monumental opportunity for the two Koreas to preserve the last of Korea's natural landscapes and native biodiversity. It could become the crown jewel of Korea's biodiversity conservation scheme; this scheme, the Korea Biodiversity Conservation Network, would connect diverse protected areas, including municipal and provincial parks and green zones throughout the peninsula, by nature corridors and greenways (7). In the eastern section of the KPBRs, the Kumgang-san Mountain in North Korea could be linked through the DMZ to the Sorak National Park in the South to establish a commonwealth park (Fig. 1).

Since the inception of the KPBRs project in 1994, effort has focused on gaining public understanding and broad-based support for the concept within South Korea. Building on the work of artists from North Korea, a group of South Korean artists have promoted the project through a series of major art events and scholarly forums, the FRONT DMZ (2), and the scientific community and the media have promoted the preservation of the DMZ ecosystems. My work has focused on engaging North Korean scientists in cooperative projects for the protection of migratory birds. Special projects are also being developed to help advance biodiversity research and conservation in North Korea. Other activities include efforts to promote and

build support for the concept of the KPBRs throughout the world.

Although major development plans for the CCZ and eventually for the DMZ are being debated by the ROK government and several industrial giants (8), President Kim Young-Sam recently proposed the conservation of the DMZ ecosystems. He challenged the DPRK to sign on to the proposal in the Special Session on Environment and Development of the United Nations (UN) General Assembly on 23 June 1997. Support from the United States, Europe, and Northeast and North Pacific countries is now needed. In addition, technical and funding assistance from the UN Environment Program, the UN Development Program, the UN Educational, Scientific, and Cultural Organization, and the World Bank and global organizations such as the World Conservation Union (IUCN) would greatly enhance the chance of successfully establishing the KPBRs.

### Where Do We Go from Here?

Although the ROK government supports the preservation of the DMZ ecosystems, major development plans for the CCZ and DMZ are being promoted by some ROK officials and industrial interests (8). No effort should be spared in educating the South Korean public about the needs and benefits of preserving the DMZ ecosystems. The principle of "juche" (self-reliance), which relates to the aesthetics and conservation of nature and beautiful landscapes, provides the ideological basis for life in North Korea (9) and, along with the current socioeconomic trends there, may provide an impetus for building support for the KPBRs. Furthermore, the progress of the Four-Party Peace Talks in replacing the 1953 Armistice Agreement with a permanent peace agreement, for which the preparatory meetings are being conducted, should provide a more favorable political climate for the KPBRs.

The immediate goal is to encourage the two Koreas to agree on the development of the KPBRs. The next step will be to develop an international multidisciplinary forum, which should include scientists and politicians from the DPRK and the ROK, to discuss the desirability, benefits, and modality of the DMZ ecosystem preservation, with a focus on political, cultural, and environmental dimensions. Once the concept of the KPBRs is accepted, the formal process of establishing the bioserves can begin with a bilateral working conference in-

volving sponsoring countries and global conservation and funding organizations. The goals of this conference should be (i) to define the configuration of the bioserves system, (ii) to discuss alternative models for the KPBRs, (iii) to define and plan the development process, (iv) to complete a formal agreement for the development and management of the KPBRs, and (v) to establish the Korea Peace Bioserves Commission and its foundation as a fund-raising entity. The development process will be enhanced by the international designation of special categories for the KPBRs, such as an IUCN Biosphere Reserve and a UN World Natural Heritage site.

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