The Mushimcheon
The Name

The Mushimcheon (無心川) is a river that flows south to north, bisecting the city of Cheongju in Chungbuk Province, South Korea. The name literally means “River Without Emotions” or “Indifferent River.” Taken from a traditional Buddhist perspective, the river’s name means “River Without Worldly Desires.” Until the Joseon period, the river was called the “Daegeyocheon” (1).

How It Flows

The river begins from two separate streams, flowing from the villages of Neaemri and Chujeongri, that merge at the village of Geumgori. The river is composed of five tributaries: the Weoruncheon, the Mipeyongcheon, the Yeonguncheon, the Myeongancheon, and the Michoollyeongcheon. It has a total length of 34.5km, a basin area of 177.71㎢, and flows into the Mihocheon, a tributary of the Geum River (2). The Geum River is one of the five major rivers in South Korea and empties into the Yellow Sea (3).

Geology

The Mushimcheon is part of the Geum River watershed region and naturally flows through sandy loam, though it has now been redirected and flows partially through concrete (4). The river is situated on the Gyeonggi Massif, which stretches through the northern part of the country (5).
Ecology of the Mushimcheon

According to the Mushimcheon Ecological Map, which splits the river into eight ecological zones, the headwaters of the Mushimcheon are near the village of Naemri (6).

In Zone 1, the river has well-developed vegetation and clear water, but the flow is weak. The river is shallow with prominent shoals of sand and gravel. Nearby farmland contributes non-point source pollution such as agricultural fertilizers. There are no aquatic plants, but round ginseng vine and Impatiens textori are scattered along the banks.

In Zone 3, the meandering riverbed is made of gravel and sand. Aquatic plants grow in the deep water near the banks. The number of plant, fish, bird, and insect species increases, and the number of amphibians and reptiles decreases. From Zone 1 to Zone 3, the water pollution remains at 0.2 mg/l, however the map notes that water quality is variable due to the farmland nearby. Korean persicary (Persicaria thunbergii) and reeds grow on the banks.

By Zone 5, the pollution increases to 0.7 mg/l. The water becomes deep and stagnant. Reeds and Korean persicary are joined by American dogwood. The number of plant and bird species increases, while the number of mammal, insect, and reptile/amphibian species decreases. The number of fish species in particular decreases drastically.

Zone 6 is situated near the downtown area. The flow is heavier and slower, and the riverbed is made of gravel and sand. The water is more than a meter deep. There are concrete walkways across the river and the number of water plants increases greatly due to the increase of deposited sediment. Asian lobelia, Asian water plantain, Sagittaria aginashi, and softstem bulrush grow on the banks. The water is relatively clear but the river is polluted with domestic sewage in addition to agricultural runoff, measuring 1.4 mg/l. The number of bird, fish, insect, and plant species more than doubles compared to the previous zone.

In Zone 7, the Mushimcheon flows through downtown. The riverbeds are concrete. There is a high level of nutrients, but the river is much more polluted, prone to drought, and the water has a higher temperature. Bamboo-leaf pondweed and Hydrilla verticillata can be found in shallow waters, struggling due to the sludge that covers them. The river is much more polluted as well, at 2.1 mg/l. The number of all species decreases significantly.

Finally, in Zone 8, the river is rich in nutrients. It is a lush habitat, however the water in this zone (as well as in Zones 6 and 7) is at risk of drought, high temperatures, and becoming oxygen-poor, leading to fish die-off. The riverbed is made of sand and sludge. This is the area furthest downstream, where the Mushimcheon merges with the Mihocheon. The river is near a factory zone, where it is exposed to chemical hazards, and the water is turbid due to the inflow of sewage. Very few aquatic plants grow, and many of the riparian plants are invasive species, indicating severe human interference. The number of species continues to decrease, excluding flora and birds, and the pollution measures 2.3 mg/l.
### Species of the Mushimcheon

The Mushimcheon Ecological Map counts a total of 156 land plant species, 40 aquatic plant species, 27 species of fish, 36 species of insect, 33 species of bird, 9 species of mammal, and 8 species of large benthic invertebrates. The number of fish species has increased from 17 species in 1975, to 21 in 1982, then 25 species in 1997, perhaps indicating a gradual improvement in water quality. (1)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Plants</th>
<th>Fish</th>
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<th>Amphibians &amp; Reptiles</th>
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<th>Insects</th>
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<td>17</td>
<td>23</td>
<td>3</td>
<td>2</td>
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</table>

### History of the Mushimcheon

Humans have lived near the Mushimcheon for thousands of years. Several artifacts have been found near the river, including Paleolithic stoneware. Ancient stone tools, pottery, and porcelain pieces have also been found at the confluence of the Mihocheon and the Musimcheon (8). The river appears in local legends, including a tragedy of a small boy who drowned in the river while in the care of a monk, which prompted the monk’s temple to build safer bridges in the boy’s honor (9).

The eastern, and older, half of Cheongju City was built on the Mushimcheon’s floodplain, making it prone to flooding. The path of the river was altered several times from the late 1800s to the 1960s: in 1906, after serious flooding, in 1939 to develop new neighborhoods, and 1969, when the current concrete embankments were constructed (3). From 1985 to 2000, urbanized areas built on the Mushimcheon watershed increased from 9.59㎢ (5%) to 16.57㎢ (8.62%). Rice fields increased from 43.81㎢ (22.23%) to 62.89㎢ (32%), and farmland increased from 15.72㎢ (7.98%) to 26.43㎢ (13.76%) (10).
Public Development

The river area was developed according to Cheongju City’s multi-stage management plan, initiated in 2005. The plan began with sediment dredging, water purification, beautification, and adding a learning center, observation areas, and rest, convenience and sports facilities. Later, public facilities like drinking fountains, a golf course, gardens, murals, benches, and a picnic area were added and night lighting was installed on the several bridges that cross the river. The total expense of construction and maintenance of the Mushimcheon public recreation area is projected to total over KRW 92.3 million (about 82 million USD) by 2021 (11).

The bicycle road that runs along the river was built in 2003 to relieve traffic congestion in downtown and encourage outdoor leisure in the city. It extends for 11.4 kilometers before connecting to another bike path that follows the Mihocheon (12).

According to the Musimcheon Development Plan, “a total project cost of KRW 4.8 billion was spent, including KRW 1.3 billion in national expenditure and KRW 3.5 billion in municipal expenses” (13).

The river area has a sports park including a roller-skating rink, walking paths parallel to the bicycle road, a designated wildlife habitat, and recreation zones.
In autumn, the Yudeung Cultural Festival is held. The festival originated from Yudeungje, a Buddhist commemoration of the more than 70,000 casualties of the Battle of Jinjuseong in 1593. However, in 2005, the festival was renamed to the “Jikji-Finding Yudeung Cultural Festival,” in celebration of the UNESCO Jikji World Records Heritage Awards ceremony honoring ikji, a book of Buddhist teachings printed in 1377 during the Goryeo Dynasty and the oldest extant book printed on movable metal type. The name was changed to the “Mushimcheon Yudeung Cultural Festival” the next year. The 4-day festival involves floating lanterns on the river to celebrate local history, arts exhibits, and musical performances (15).

Ornamental flowers are planted along the roads bordering the river area and in spring many people turn out to see the blooming cherry blossoms. 4km of white and pink cherry blossoms, yellow forsythia, and green reeds and willows are planted along the river road, as well as a rose garden and annuals that are cared for partially by volunteers. Springtime excursions often end with a trip to the riverside Yonghwasa Temple. The temple was founded in 1902 after Umbi, a concubine of Gojong, the last king of the Joseon dynasty and first emperor of Korea, dreamed that seven buddhas asked for a temple to be built near the Mushimcheon (14).