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4.2°C Rise by 2080 Could Wipe Out 19 of 28 Endangered Fish Species

- Nakdonggang National Institute of Biological Resources analyzes the distribution of 28 endangered wild fish species under a greenhouse gas emission scenario with rising average temperatures

The Nakdonggang National Institute of Biological Resources (NNIBR, President Yong Seok-won) under the Ministry of Environment announced that if the greenhouse gas emission scenario, which projects an average temperature rise of 4.2°C by 2080, is actually applied, 19 out of 28 fish species designated as endangered wildlife could disappear.

The 28 endangered wild fish species analyzed this time consist of 11 Class I species and 17 Class II species.

* A total of 29 endangered wild fish species have been designated, including 19 endemic species, but the black star fat minnow (Endangered Wildlife Class II) was excluded from this analysis due to a lack of distribution data.

The analysis showed that under the climate change scenario in which the average temperature rises by 4.2°C by 2080, 19 of these fish species are expected to disappear.

The 19 species are: Buan spine loach, Hangang bitterling, slender shinner, Chinese nine spine stickleback, black shinner, aucha perch, cat's eye eightbarbel gudgeon, short eightbarbel gudgeon, yellow fin sculpin, Korean bitterling, Miho spine loach, Tachanovsky's gudgeon, spotted barbel, Eurasian minnow, Manchurian lenok, large striped bitterling, bullhead torrent catfish,

Tumen river sculpin, and white eightbarbel gudgeon. Among these, 13 species*, including the Buan spine loach, are endemic to Korea and found nowhere else.

* Buan spine loach, Hangang bitterling, slender shinner, black shinner, cat's eye eightbarbel gudgeon, short eightbarbel gudgeon, yellow fin sculpin, Korean bitterling, Miho spine loach, spotted barbel, large striped bitterling, bullhead torrent catfish, white eightbarbel gudgeon

The research team at the NNIBR used biodiversity survey data accumulated by the National Institute of Environmental Research, the Korea National Park Service, and the National Institute of Ecology, as well as the “National Climate Change Standard Scenario” provided by the Korea Meteorological Administration and the National Spatial Information Platform, for this analysis.

The ‘National Climate Change Standard Scenario’ incorporates the ‘high-carbon emission scenario (SSP5)*’, presented by the United Nations Intergovernmental Panel on Climate Change (IPCC) in August 2021.

* A scenario in which the use of fossil fuels and reckless development focused solely on economic growth leads to a rapid increase in greenhouse gas emissions

The ‘high-carbon emission scenario (SSP5)’ projects that by 2080, global greenhouse gas emissions will reach about 129.5 gigatons (GtCO₂), more than three times the 2023 level of 37.8 gigatons (GtCO₂). If this scenario unfolds, the average temperature in Korea will rise by about 4.2°C.

The research team predicted that under this scenario, the Chinese nine spine stickleback, Buan spine loach, and Hangang bitterling would be the first to disappear by 2050. And by 2080, the range of extinctions would expand to include species such as the white eightbarbel gudgeon, Manchurian lenok, and spotted barbel.

In contrast, if the ‘low-carbon emission scenario (SSP1)*’ unfolds, global greenhouse gas emissions are projected to decrease to about 33.4 gigatons

(GtCO₂) by 2080, and 93% (26 species) of the endangered wild fish analyzed in this study are expected to survive even in 2080.

* A scenario aimed at sustainable and eco-friendly growth, in which greenhouse gas emissions are significantly reduced.

Ryu Si-hyun, Deputy Minister of the Biodiversity Research Team at the NNIBR, stated, “This study scientifically analyzed the impact of climate change on biological species by utilizing national public data collected long-term by various institutions.”