

Distribution modeling of *Onychodactylus koreanus* predicts drastic decrease of suitable habitats in response to climate change

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Introduction

- Korean clawed salamander (*Onychodactylus koreanus*) is endemic to the Korean Peninsula.
- Strict habitat specialist of low temperature forests and streams (Suk et al., 2017).
- Likely to be highly prone to climate change (Suk et al., 2017).
- Potential impacts of climate change on the genus have never been assessed.

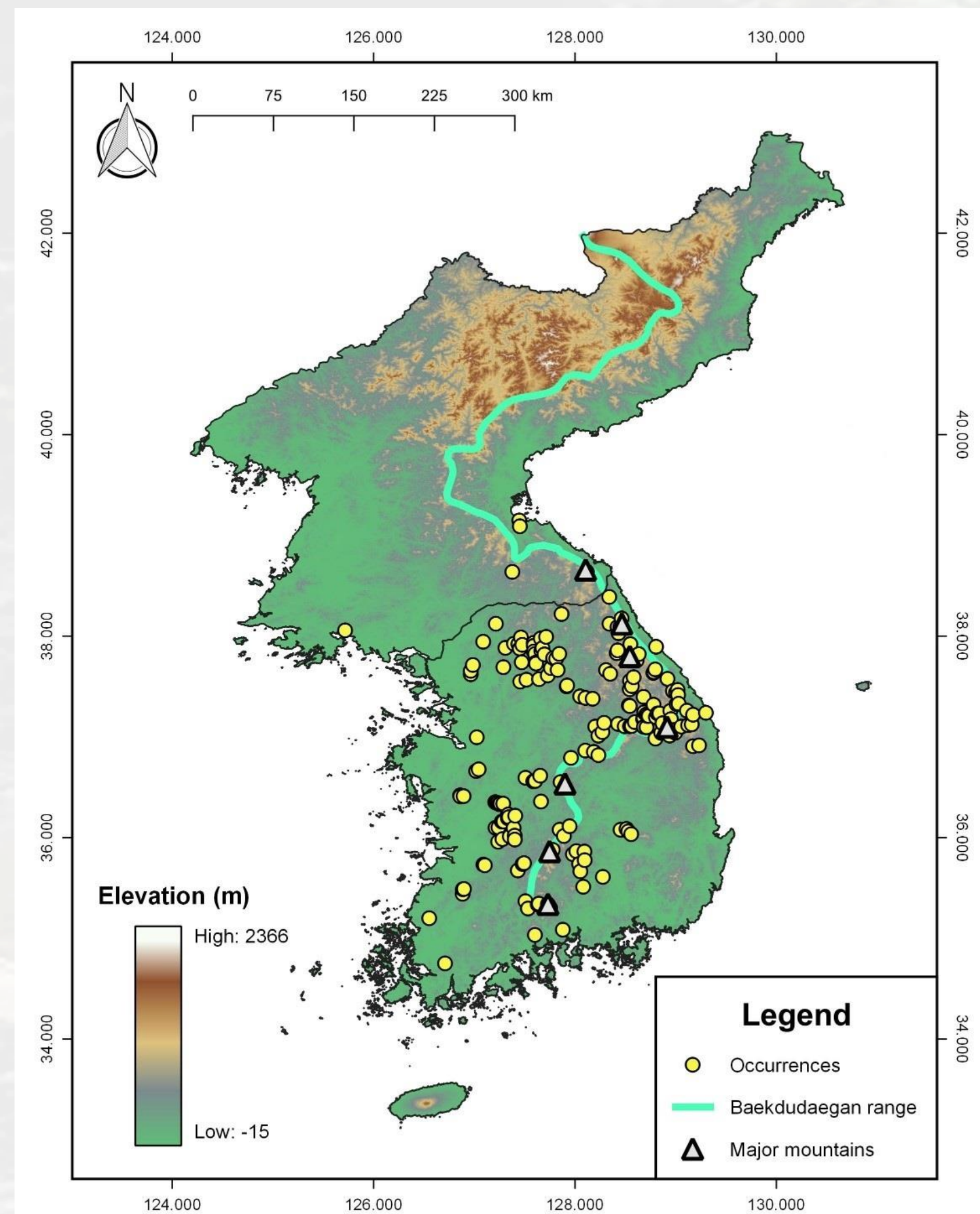


Figure 1. Location of occurrence points of *Onychodactylus koreanus* used in modeling.

Methods

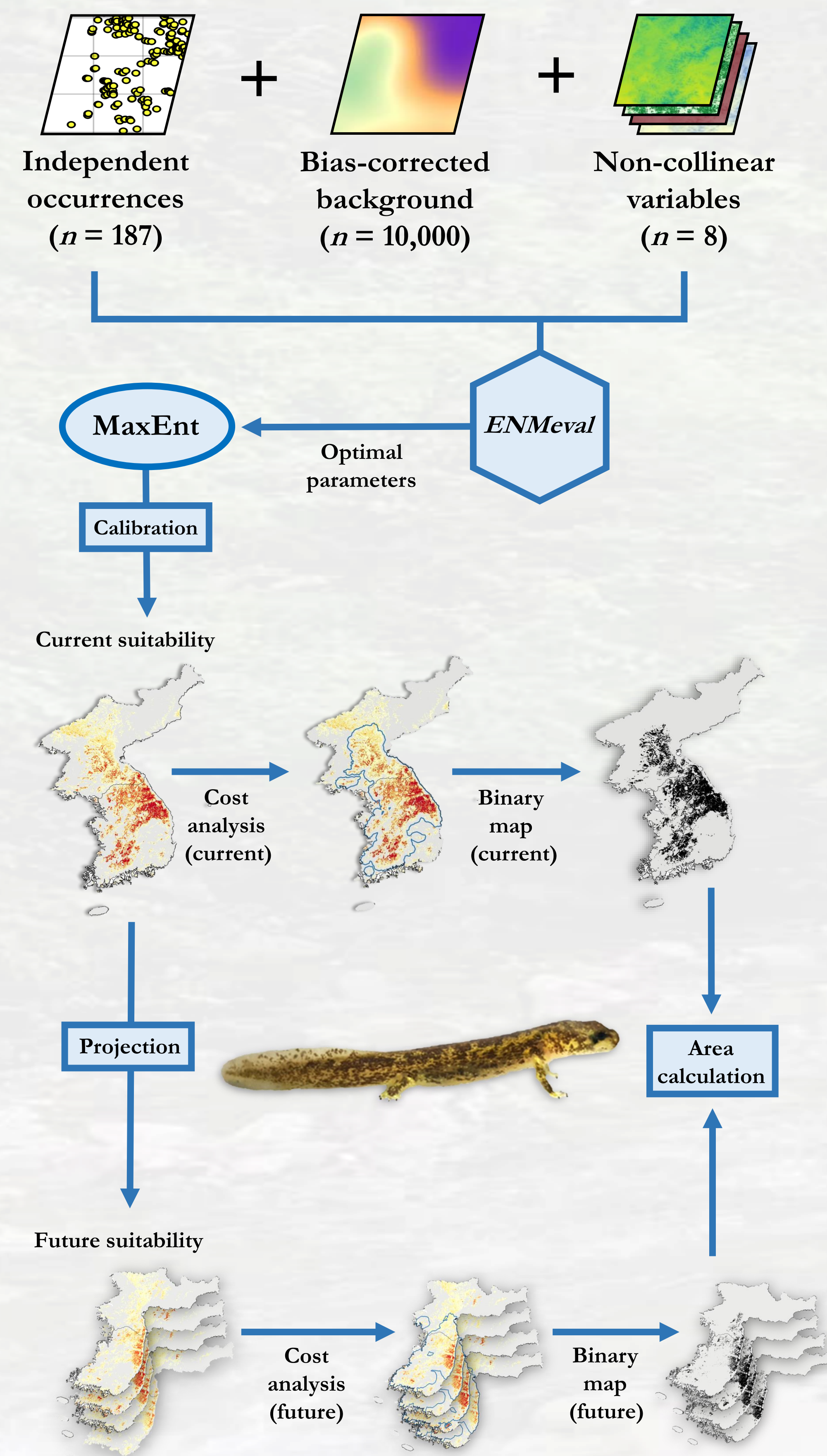


Figure 2. Schematic workflow of modeling process.

Results & Discussion

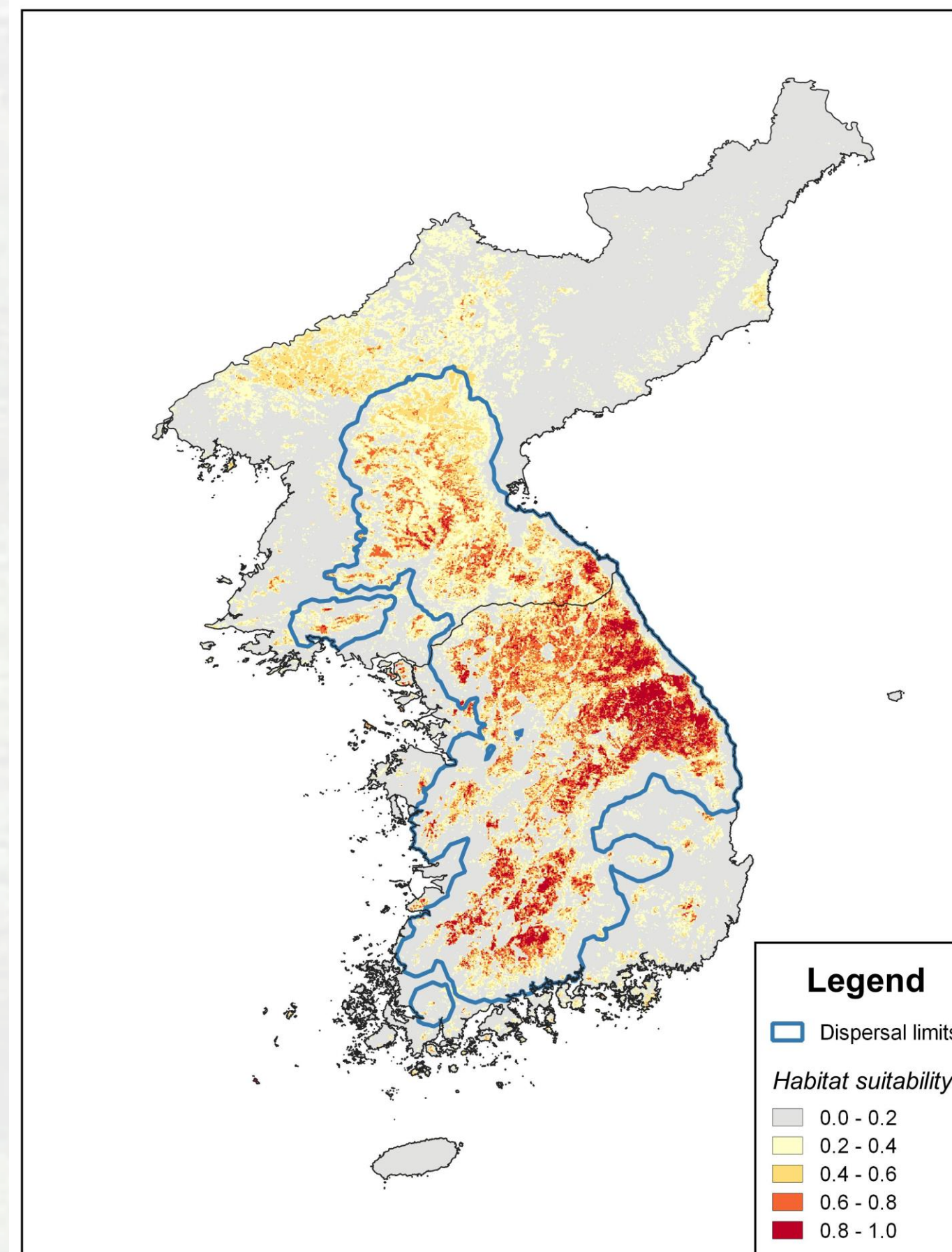


Figure 3. Current habitat suitability model (AUC = 0.89; TSS = 0.65) is congruent with known distribution (Poyarkov et al., 2012).

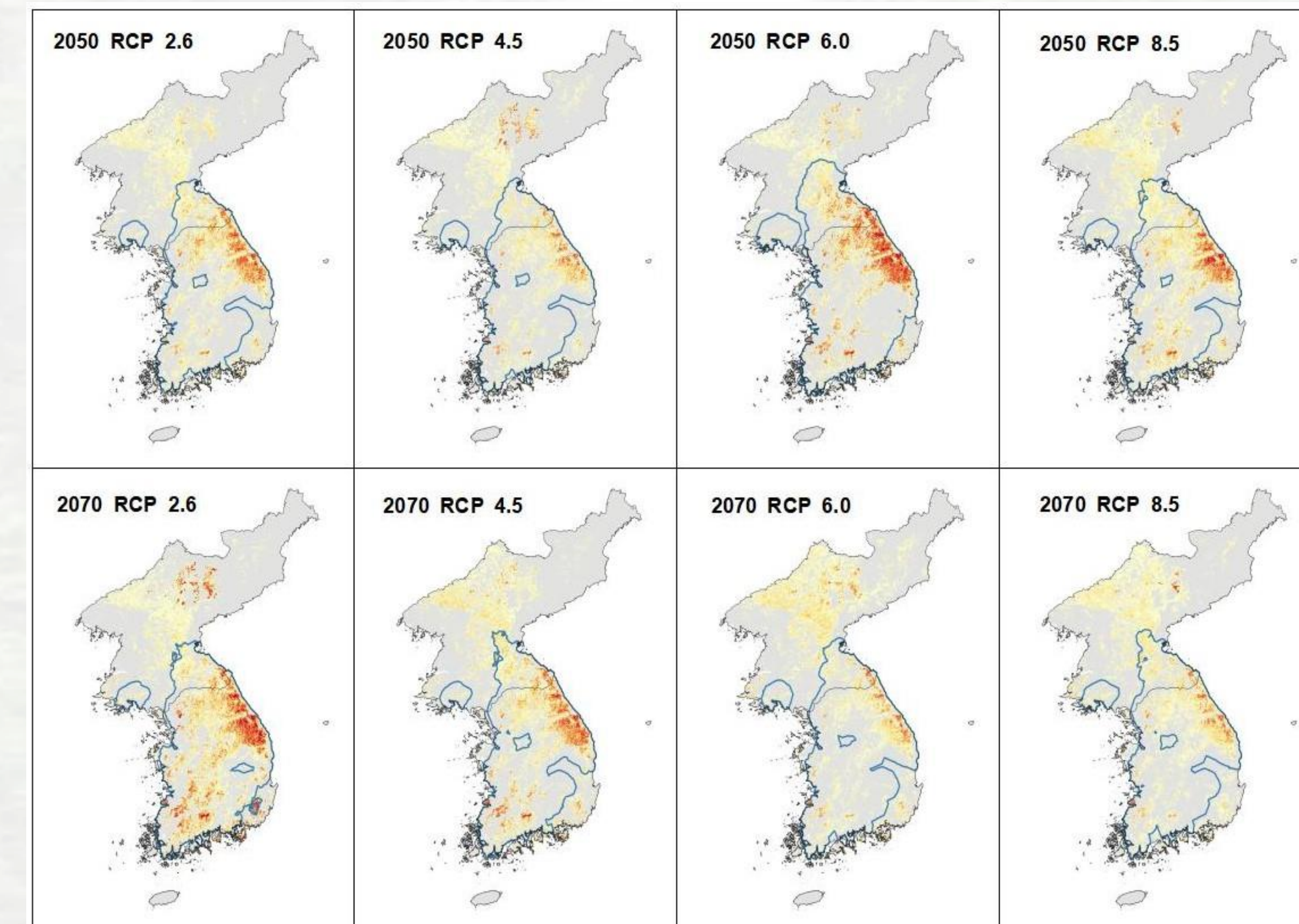


Figure 4. Future habitat suitability models suggest drastic decrease of suitable habitats. Dispersal limits simulated from cost analysis suggest limited dispersal ability across contemporary and future landscapes.



Figure 6. Typical mountain stream habitat of *Onychodactylus koreanus* in the Republic of Korea.

- Habitats of *O. koreanus* are likely to reduce severely due to climate change.
- Additive threats of deforestation and pollution can accelerate population decline.
- Conservation status of *O. koreanus* require close attention.
- Investigations in thermal physiology and movement ecology can improve model predictions.
- Distribution modeling approach can be expanded to other *Onychodactylus* species.

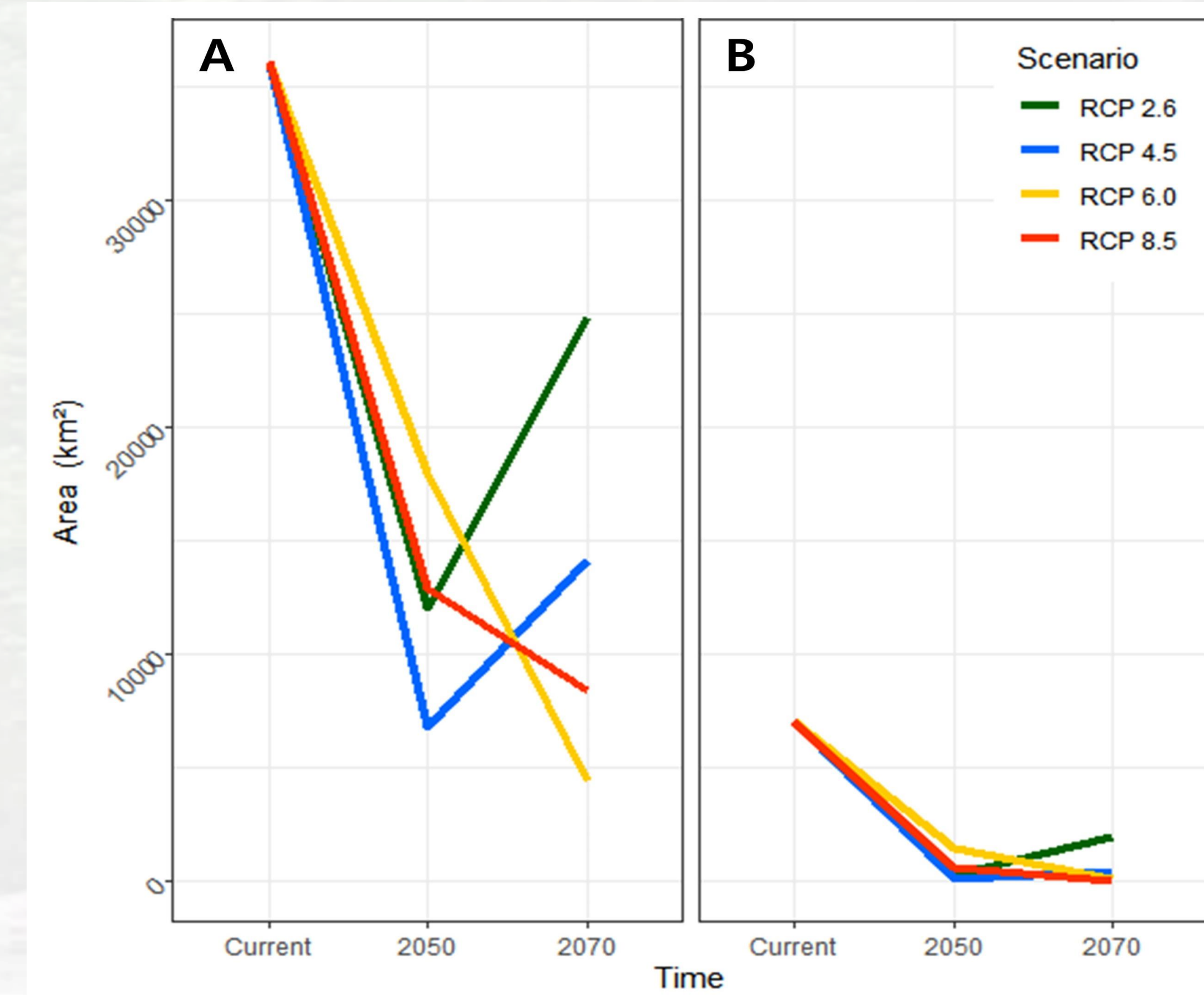


Figure 5. Area of suitable (A) and optimal habitats (B) through time according to each projected climate change scenario. Note the sharp decreasing trend between the present and the year 2050.

References

- Poyarkov NA, et al. 2012. Review of the systematics, morphology and distribution of Asian Clawed Salamanders, genus *Onychodactylus* (Amphibia, Caudata: Hynobiidae), with the description of four new species. Zootaxa 3465: 1-106.
- Suk HY, et al. 2017. Phylogenetic structure and ancestry of Korean clawed salamander, *Onychodactylus koreanus* (Caudata: Hynobiidae). Mitochondrial DNA Part A 29: 650-658.