

## Climate Change impacts the distribution of *Kelussia odoratissima* Mozaff., an endangered, monotypic, endemic plant in Chaharmahal and Bakhtiari Province, Iran

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### INTRODUCTION & AIM

Endangered endemic medicinal plants are facing the risk of habitat destruction, overexploitation, and climate change. Predicting their potential distribution accurately using species distribution models (SDMs) can help prevent the loss of plant diversity and ecological destruction caused by climate change. *Kelussia odoratissima* Mozaff., also known as Mountain celery, is a valuable edible and medicinal plant species that is unique to the central Zagros highlands (Fig. 1) (Zeraatkar et al. 2023). It is utilized in traditional medicine and contains bioactive components with pharmacological properties. However, due to the environmental impact of population growth, the plant is now at serious risk of extinction.

### METHOD

In this study, we utilized a maximum entropy model (MaxEnt) to determine the potential distribution of *K. odoratissima*, in one of the main centers of its distribution, Chaharmahal and Bakhtiari province, under two representative concentration pathways (RCP 2.6 and RCP 8.5) for the 2050s and 2070s.



Fig. 1. *Kelussia odoratissima* in natural habitats, Photographed by A. Zeraatkar

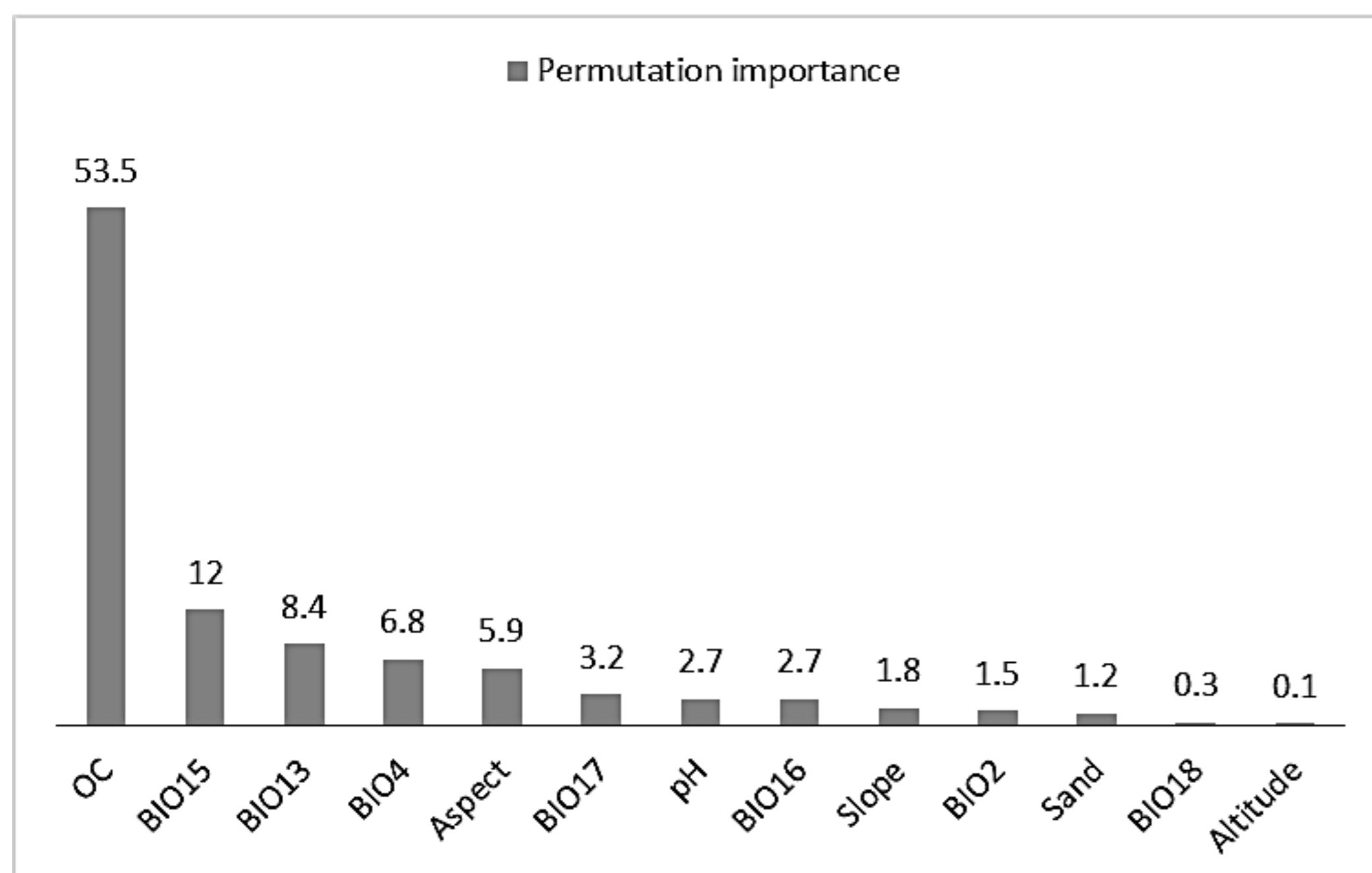


Fig. 2. The percentage of permutation importance for environmental factors used in SDM of *K. odoratissima* in Chaharmahal and Bakhtiari province

### RESULTS & DISCUSSION

The MaxEnt model was effective, as evidenced by an AUC value exceeding 0.9. The results indicated that the distribution of this taxon was primarily influenced by the soil organic carbon content, precipitation seasonality (Bio15), and precipitation of the wettest month (Bio13) (Fig. 2). The model predicts a reduction in the suitable habitats of *K. odoratissima* under all scenarios in the 2050s and 2070s (Fig. 3). It is estimated that between 26.72% and 71.61% of the species' preferred habitats will be lost. The province's northwestern, western, and southern parts are expected to bear the brunt of these effects, leading to a significant reduction in suitable habitats for this species. Climate change is expected to significantly impact the distribution and habitat suitability of this species, with important ecological and socio-economic consequences. Urgent conservation efforts are needed to prevent extinction and preserve

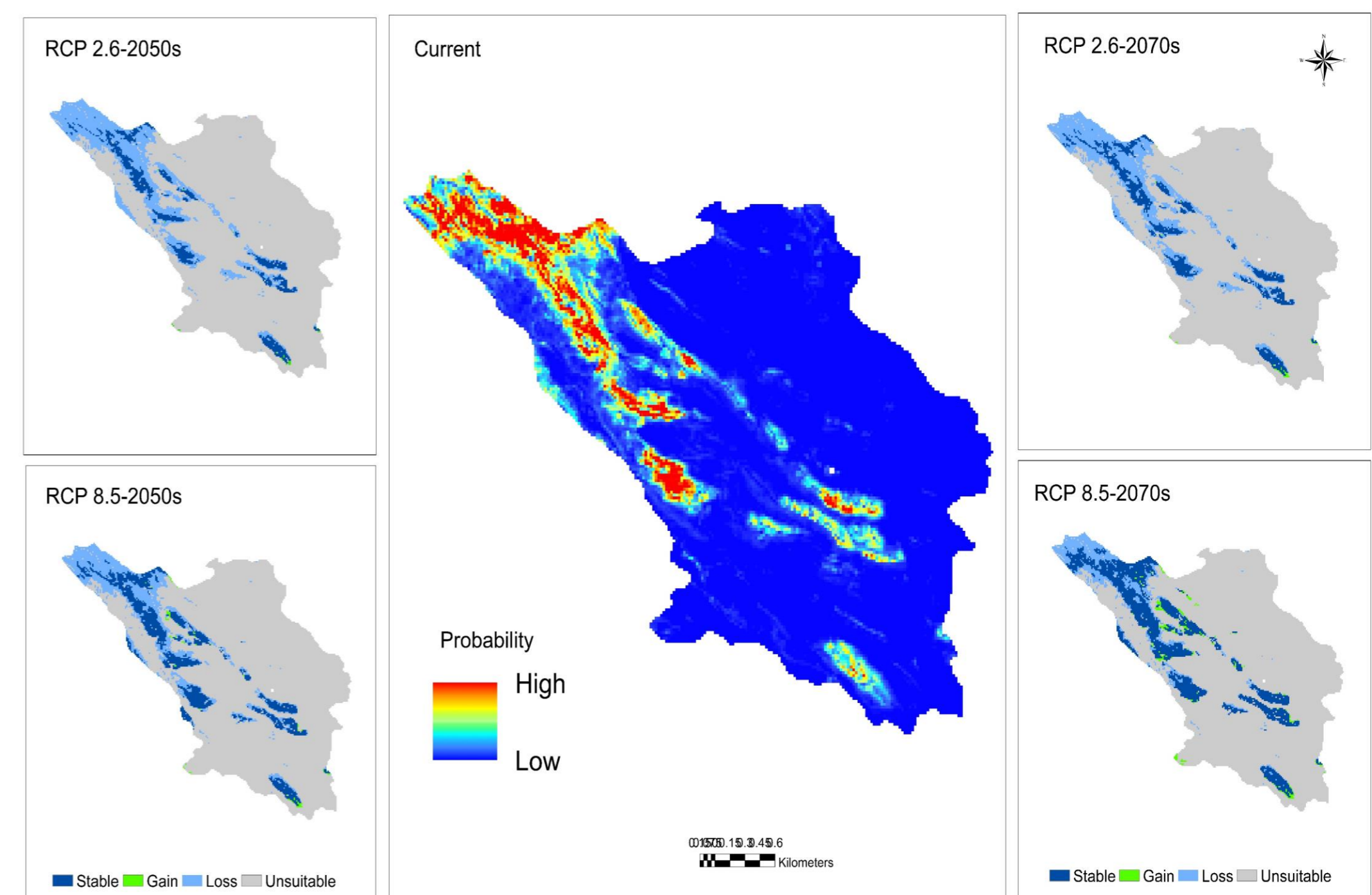


Fig. 3. Map for potential current and future habitat suitability of *K. odoratissima* in Chaharmahal and Bakhtiari province

### CONCLUSION

The findings are significant for the preservation, management, and continued study of this endangered and medically valuable plant in Chaharmahal and Bakhtiari province.

### REFERENCES

Zeraatkar A, Iranmanesh Y, Mokhtarpour T, Shirmardi H, Jamzad Z, Jalili A, Mousavi Vardanjani SA, Soleimani, E. *Kelussia odoratissima* Mozaff., a green jewel in Zagros' rich floral treasure: Conservation status, threats, and opportunities. *Iran Nature* 2023; 8(4): 123-134. <https://doi.org/10.22092/irn.2023.362276.1516>