

Potential decline in the distribution and food provisioning services of the mopane worm (*Gonimbrasia belina*) in southern Africa

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Background

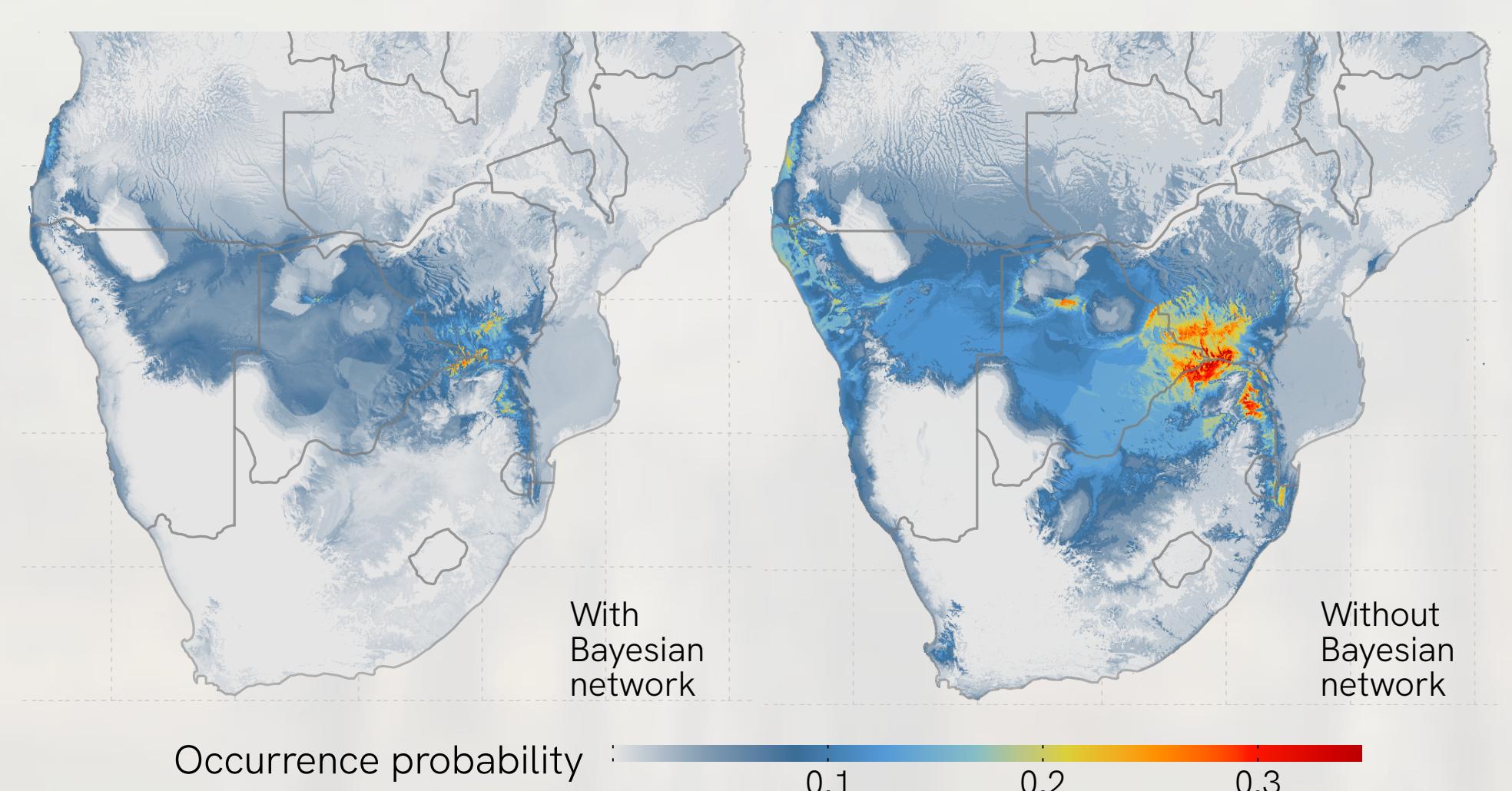
The mopane worm is an edible insect widely harvested and consumed across southern Africa. We want to understand how climate change would impact the availability and food provisioning services provided by this insect.



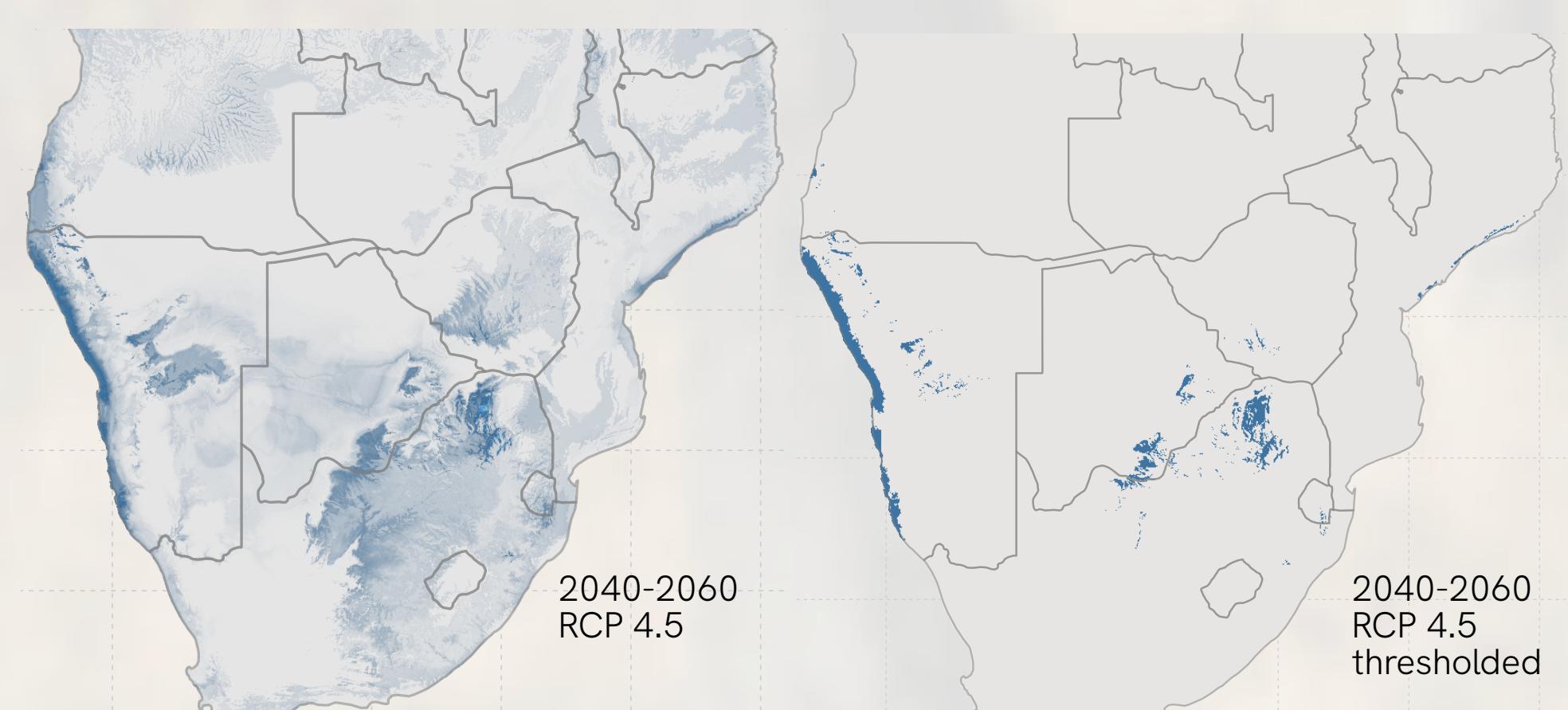
Obstacle

The mopane worm is dependent on its food trees, and is predated on by many species, so we need to include these interactions to better model the current and future distribution of the mopane worm.

Results



Mopane worm distribution probability of occurrence with (left) and without (right) Bayesian networks under present climate conditions.



Mopane worm distribution predictions for 2040-2060 under RCP 4.5 with Bayesian network and with threshold applied for presence absence.

Methods

We built SDMs using GBIF and CHELSA data for the mopane worm and 29 species that were identified to interact with the mopane worm.

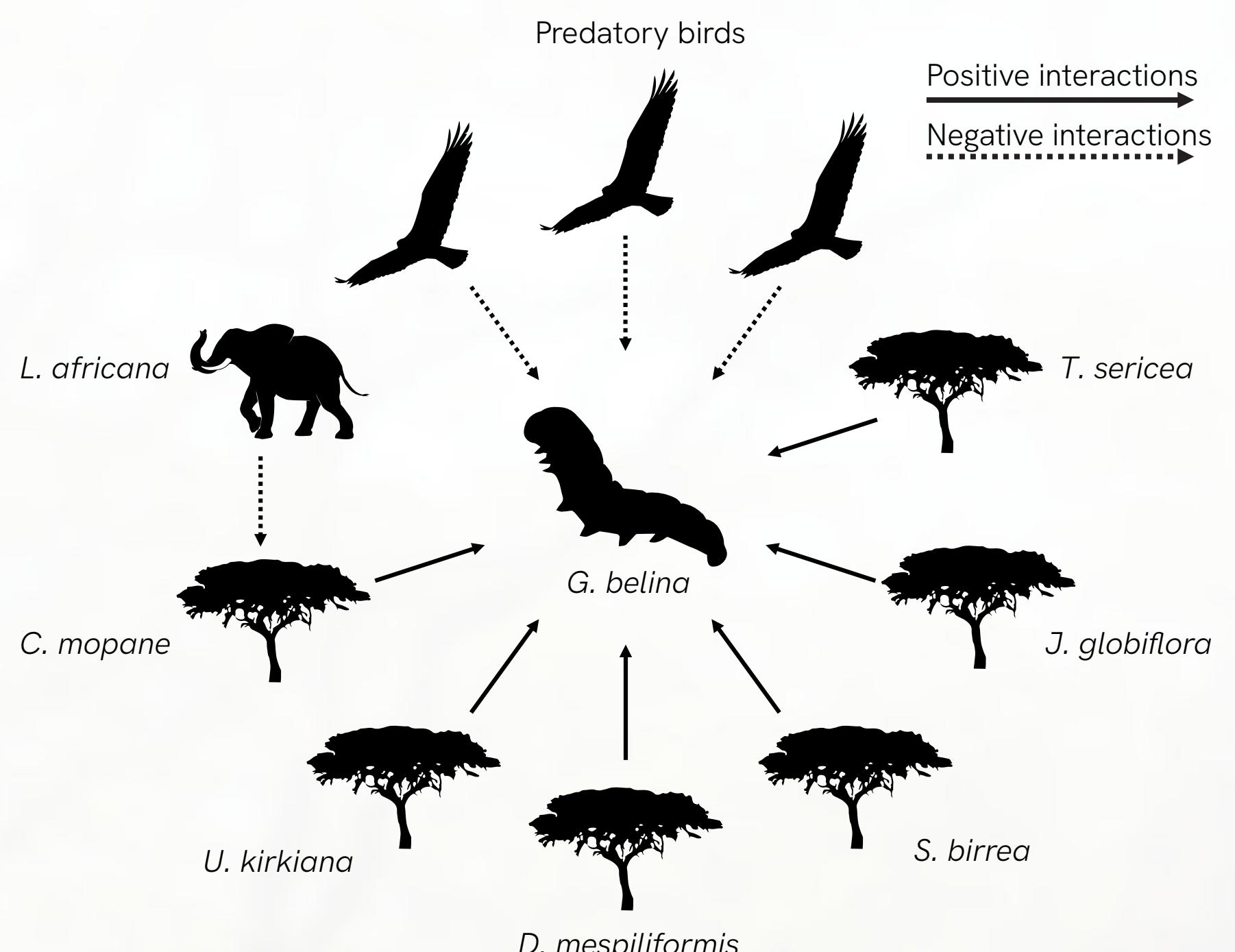
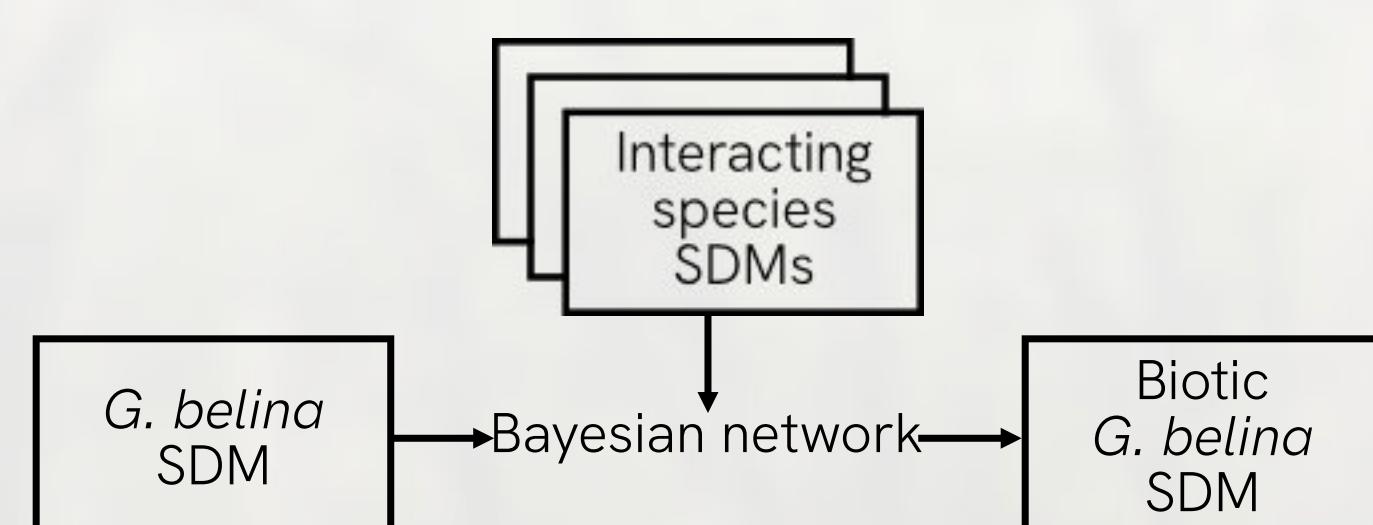


Diagram of identified biotic interactions used for the Bayesian network

Then we applied a Bayesian network method to model the biotic interactions for the mopane worm.



Conclusions

- Climate change will likely negatively impact the distribution of the mopane worm.
- This will have negative implications for the availability and food provisioning services of the mopane worm.
- Including biotic interactions in our models predicts much more loss in habitat suitability.
- This reveals a potentially substantial source of uncertainty in distribution models.
- Reality is probably an intermediary between the biotic and non-biotic interaction models.

Acknowledgements

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