



ANYL4PSD
REGIONAL TEACH-IN ON
CLIMATE JUSTICE
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Conservation Prioritization in the Congo Basin: Planning for 2080

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Multifarious Threats

Deforestation



Overpopulation



Mining

Infrastructure

Wildlife Trafficking



Climate Change

An aerial photograph showing a river flowing through a lush, green forest. The river's path is winding, creating several loops and small lakes within the dense vegetation. The surrounding terrain appears to be a mix of forest and possibly some agricultural land or roads in the distance.

How best to conserve?

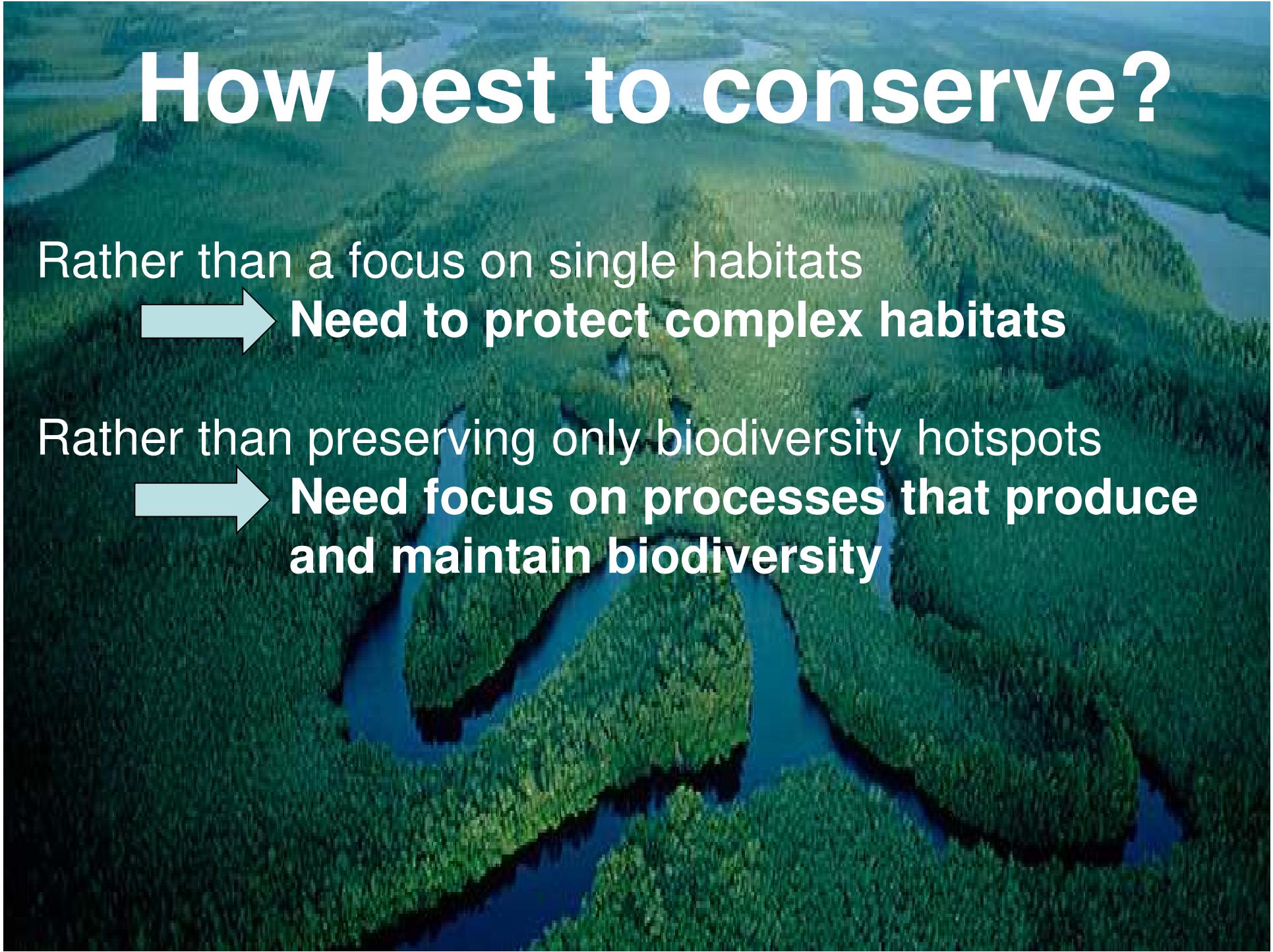
How best to conserve?

Rather than a focus on single habitats

→ **Need to protect complex habitats**



How best to conserve?

An aerial photograph showing a river winding its way through a lush, green forest. The river's path is clearly visible as a dark blue line against the surrounding vegetation. The forest appears dense and healthy, with various shades of green.

Rather than a focus on single habitats

→ **Need to protect complex habitats**

Rather than preserving only biodiversity hotspots

→ **Need focus on processes that produce
and maintain biodiversity**

How best to conserve?

Rather than a focus on single habitats

→ **Need to protect complex habitats**

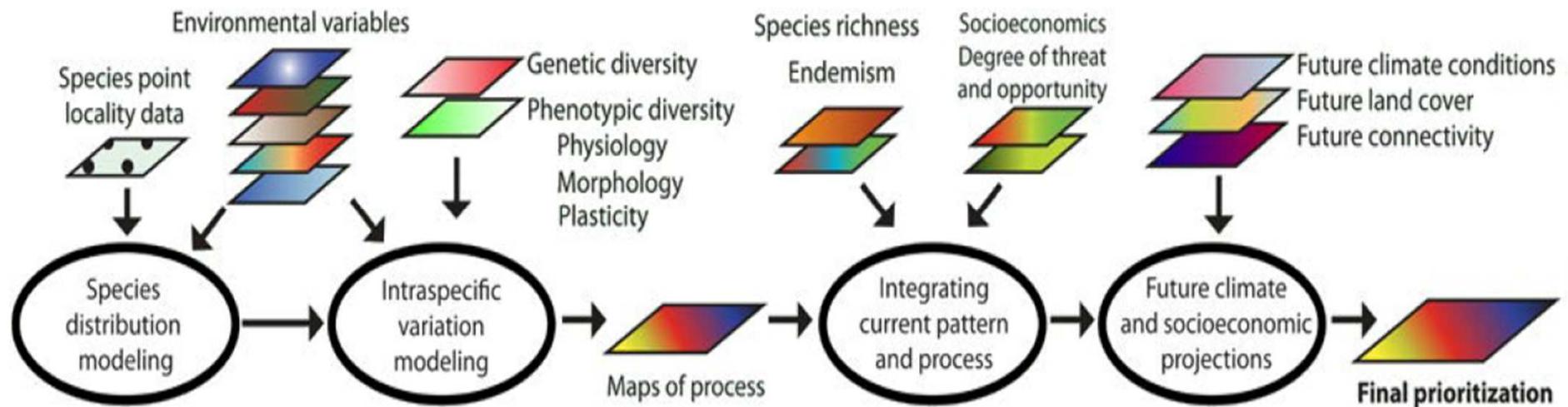
Rather than preserving only biodiversity hotspots

→ **Need focus on processes that produce
and maintain biodiversity**

Rather than mitigating one threat at a time

→ **Need an integrated approach that
mitigates multiple threats simultaneously**

Mapping priority areas for conserving biodiversity under climate change

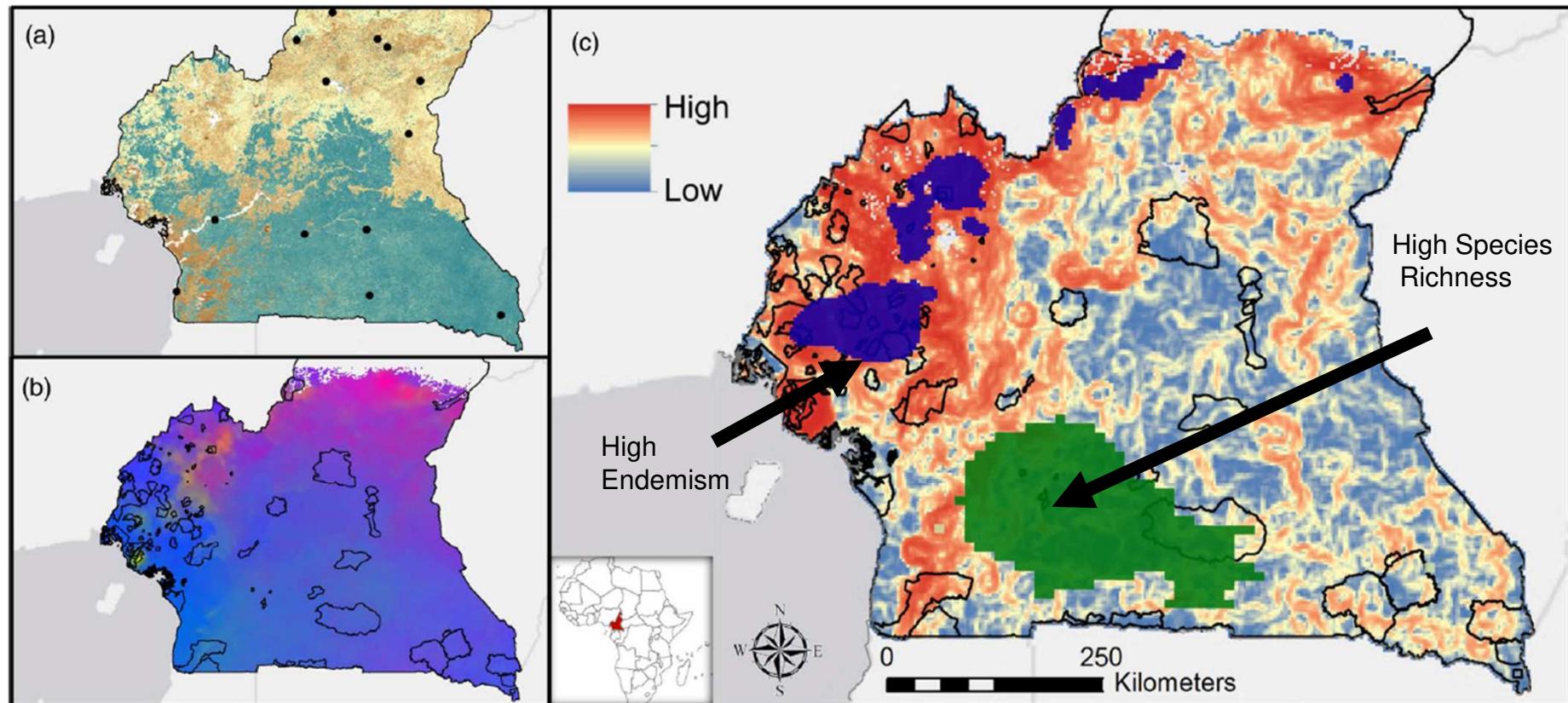


Example

Little Greenbul (*Andropadus virens*)



Genomic variation and turnover of the little greenbul across its range



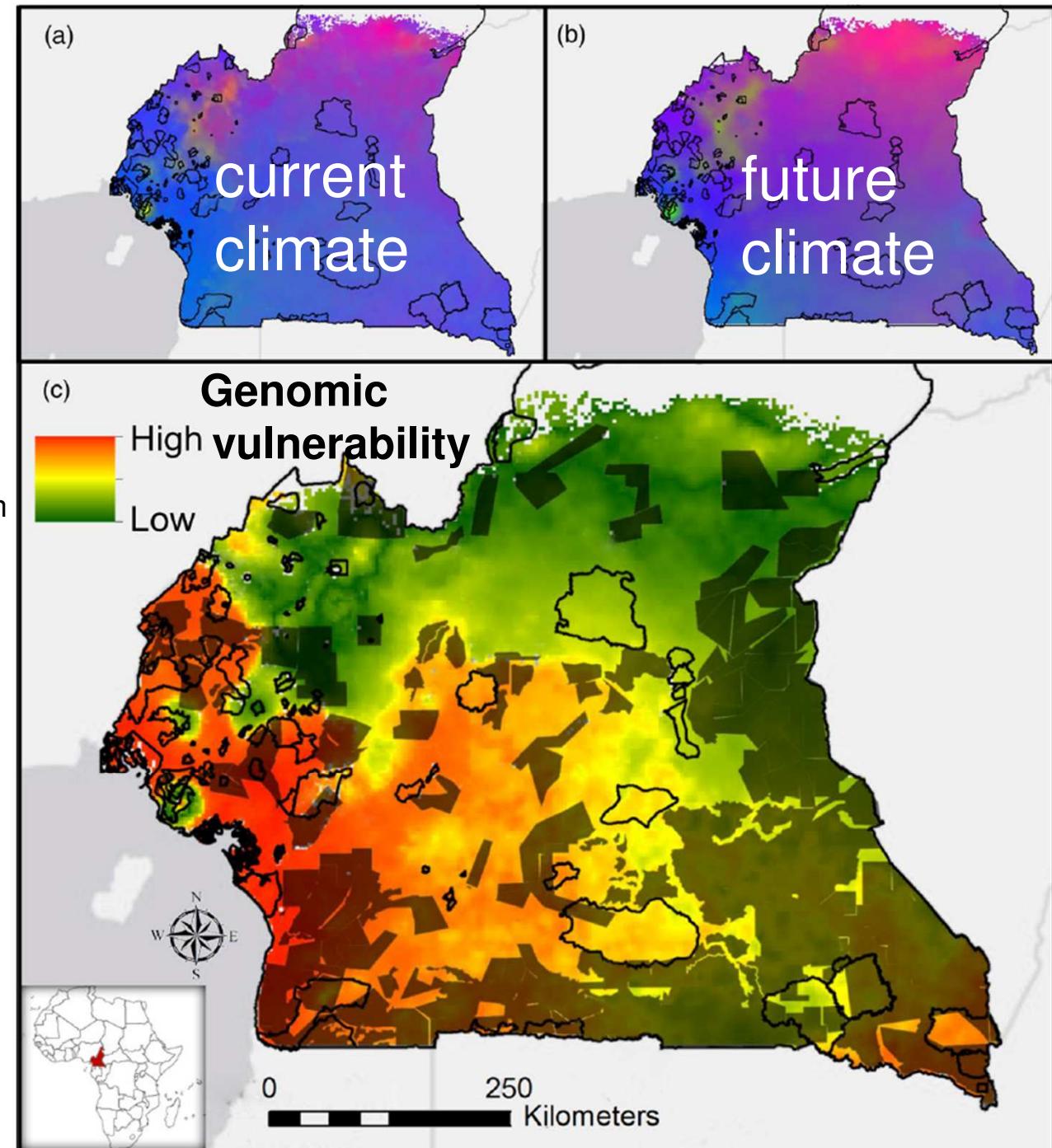
Zhen et al. 2019 Molecular Ecology
Smith et al. 2020 Evolutionary Applications

Patterns of genomic diversity and genomic vulnerability under current and future climate

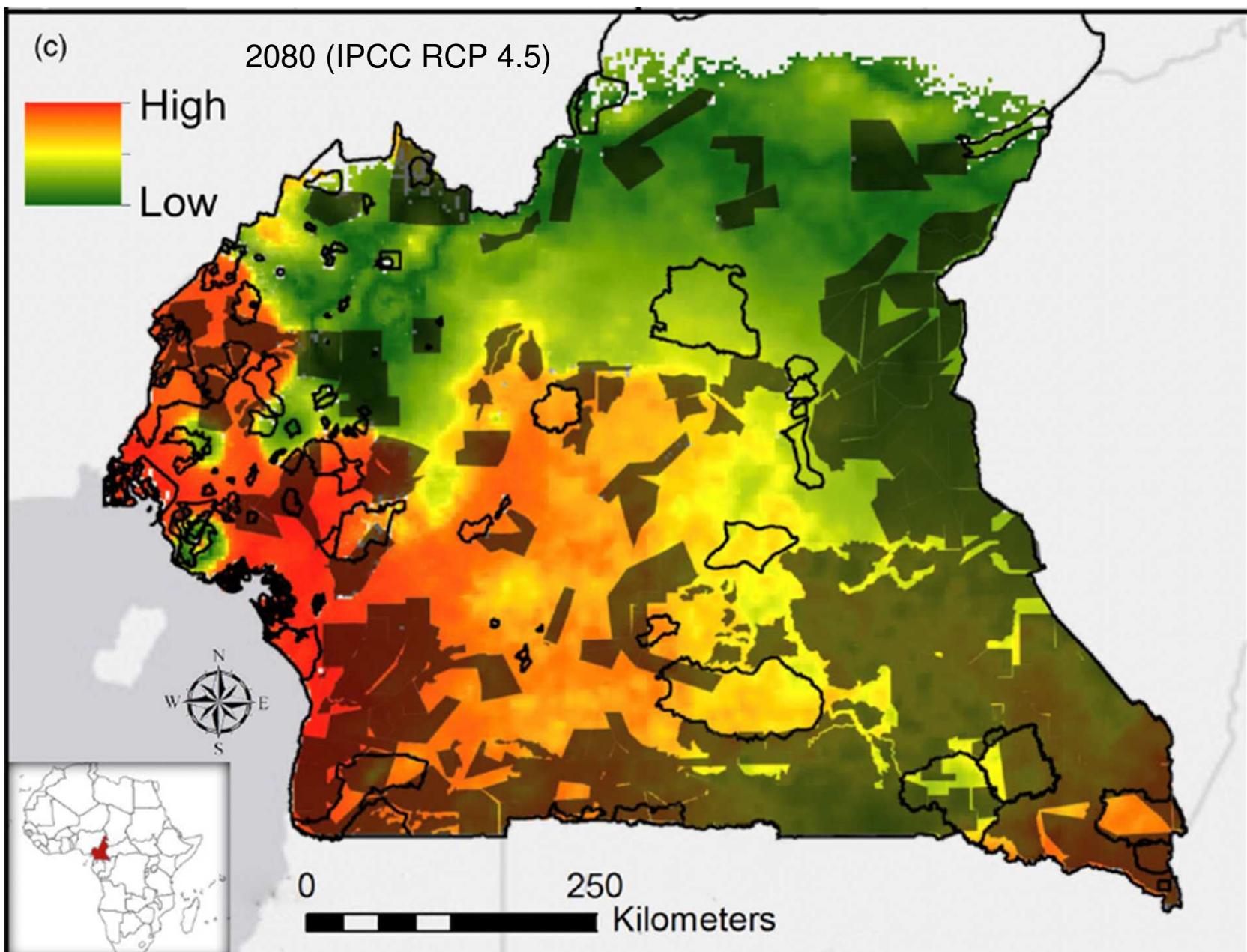
genomic vulnerability = mismatch between current and predicted future genomic variation based on genotype-environment relationships modeled across contemporary populations

35,000 SNPs filtered to 7,000 correlated with current climate

RCP 4.5 2080 scenario



Genomic vulnerability



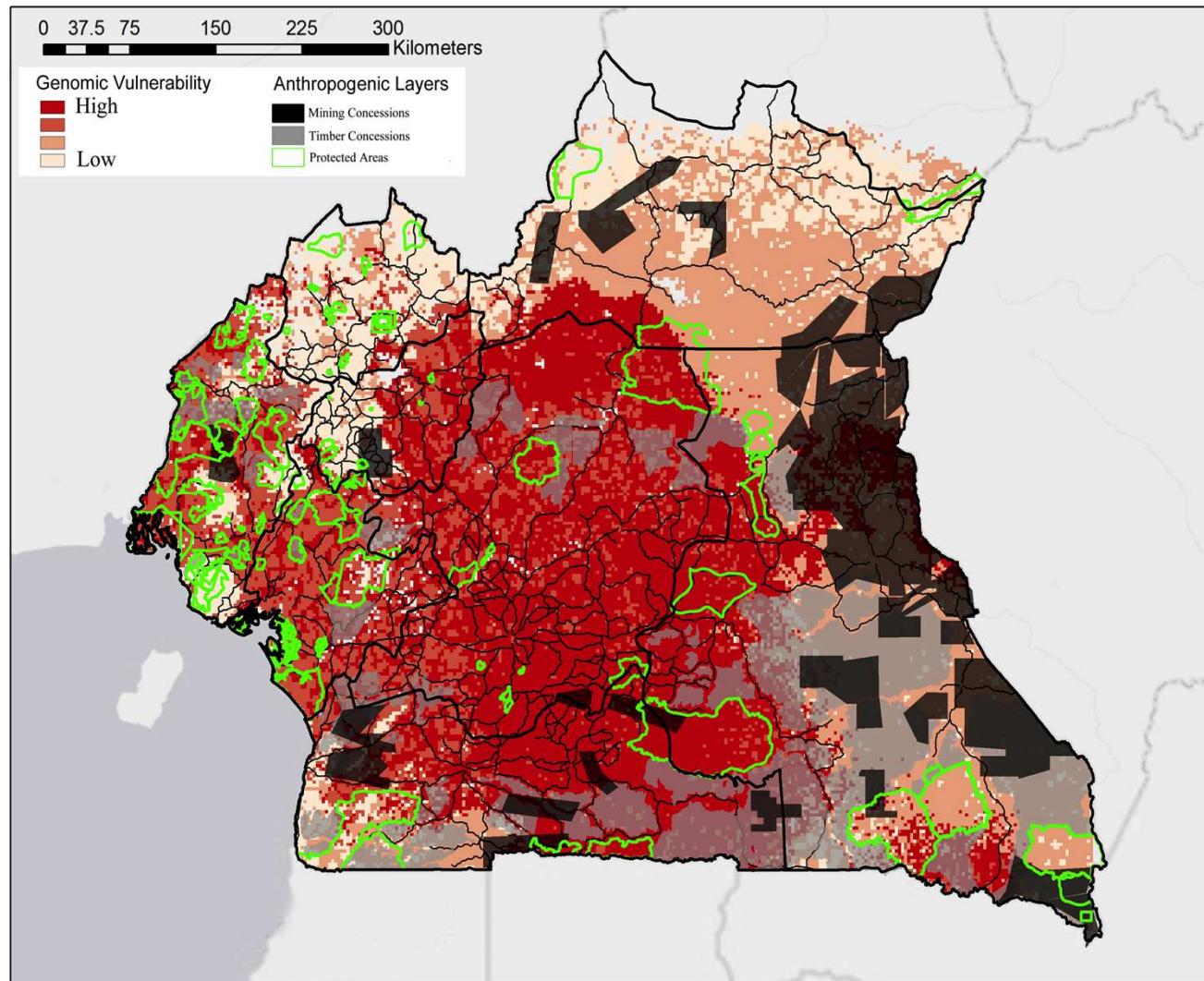
Smith et al. 2020 Evolutionary Applications

NEXT STEPS:

Integrate data and map genomic vulnerability across diverse taxa

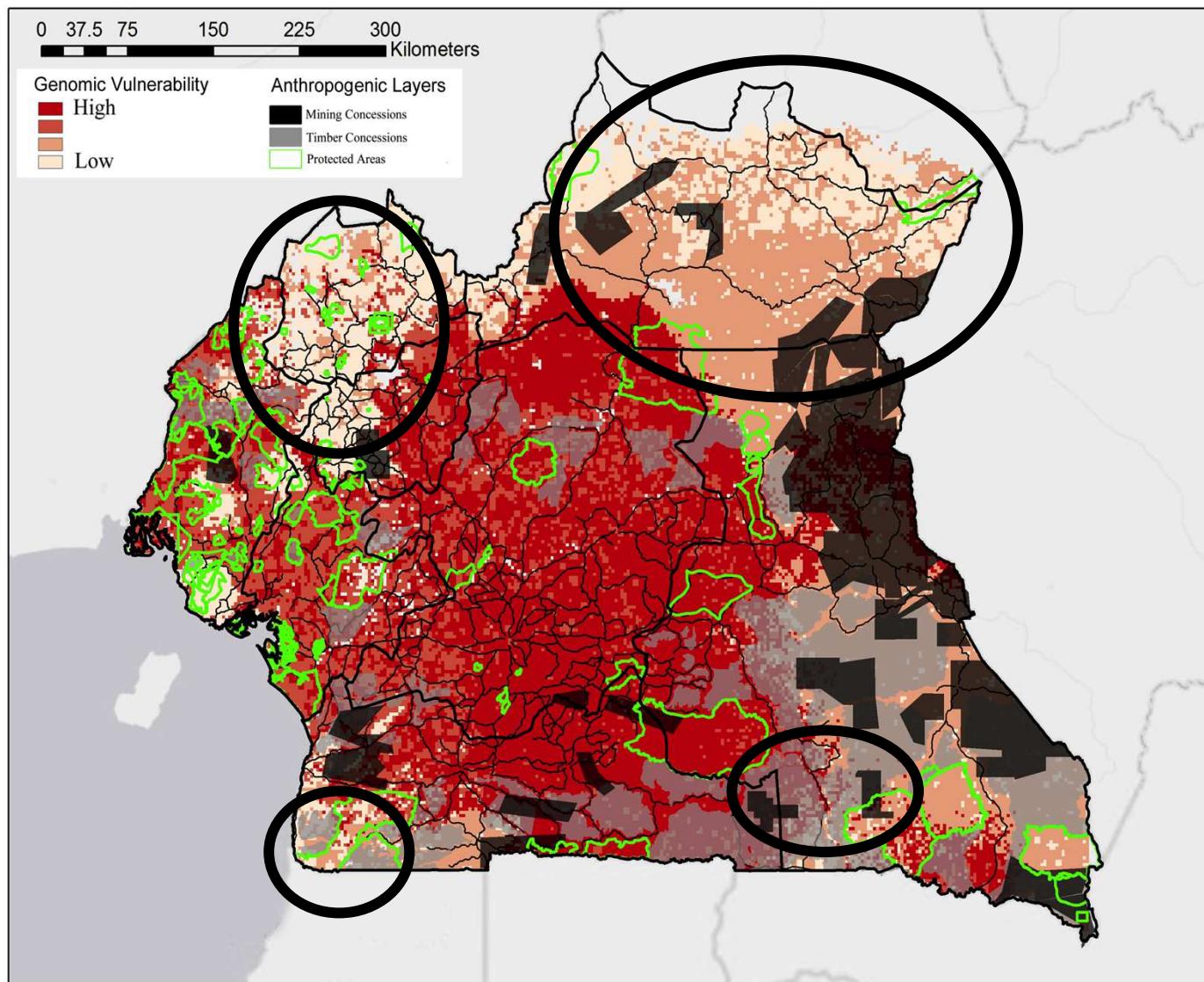


Preliminary multi- taxa genomic vulnerability under future climate change



- Model was projected forward to 2080 (RCP 4.5)
- To persist in the bright red areas 50 years from now will need them to evolve at a rate 300 times faster than they have done since the last glacial maximum.

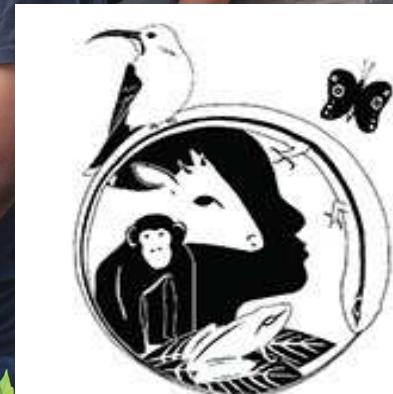
Preliminary gap analysis under future climate change



- Priority areas for protection under future climate change



Thanks to collaborators



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WHERE DISCOVERIES BEGIN



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and Space Administration

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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