

ATTRIBUTION OF POPULATION TRENDS TO RARITY AND FOREST COVER

THE UNIVERSITY of EDINBURGH

University of St Andrews

Gergana Daskalova, Isla Myers-Smith, John Godlee



gndaskalova@gmail.com









IMPACT

- Understand global change drivers
- Advance global population syntheses
- nform international conservation policy

POPULATIONS ARE CHANGING AND WE NEED TO KNOW WHY



- State-space models to quantify population trends
- Comparison across rarity, taxa and forest cover

GREY SEAL Population increase 58% Population increase



ARE RARE SPECIES MORE LIKELY TO **DECLINE THAN COMMON SPECIES?**

Population trends do not vary based on rarity and Red List status².

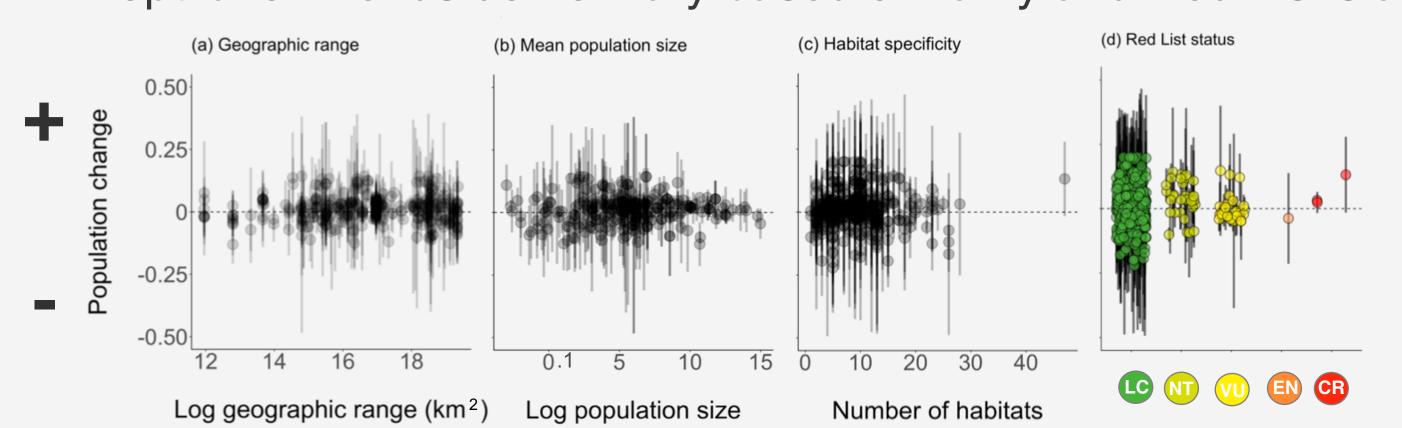
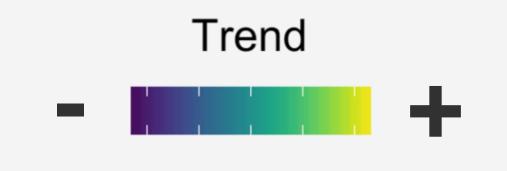


Figure 2. Trends of 381 UK populations from 167 vertebrate species across rarity metrics (a-c) and Red List status (d).

Figure 1. Trends of 9284 populations from 2074 vertebrate species from the Living Planet Database¹.



DIFFERENCES IN TRENDS MAY ALTER FUTURE COMMUNITY COMPOSITION

IS THERE A TAXONOMIC PATTERN IN POPULATION TRENDS?



Population trends varied across the five studied taxa.

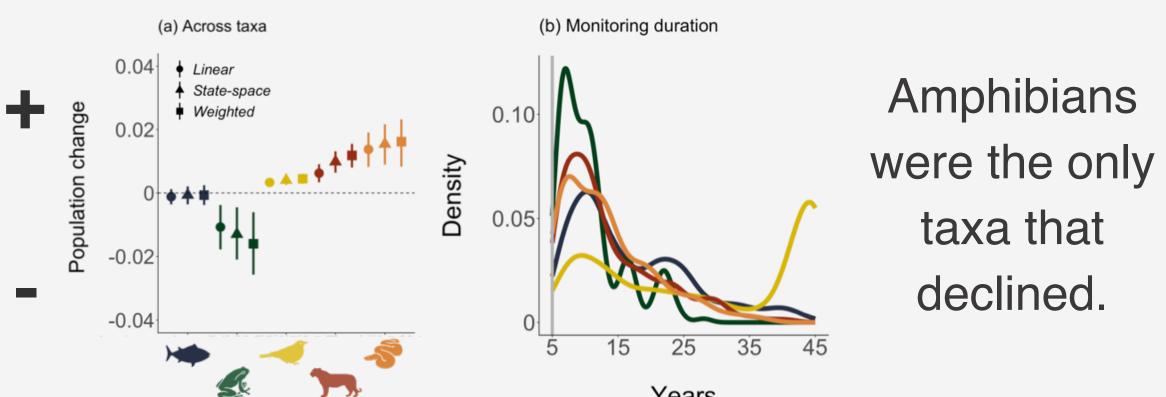
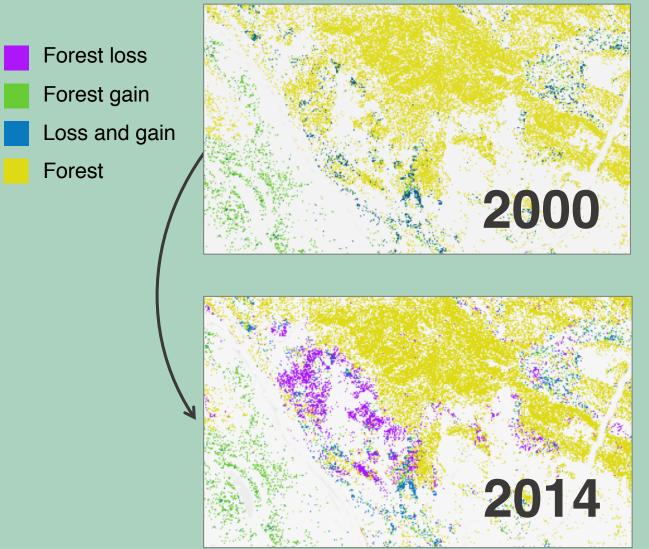
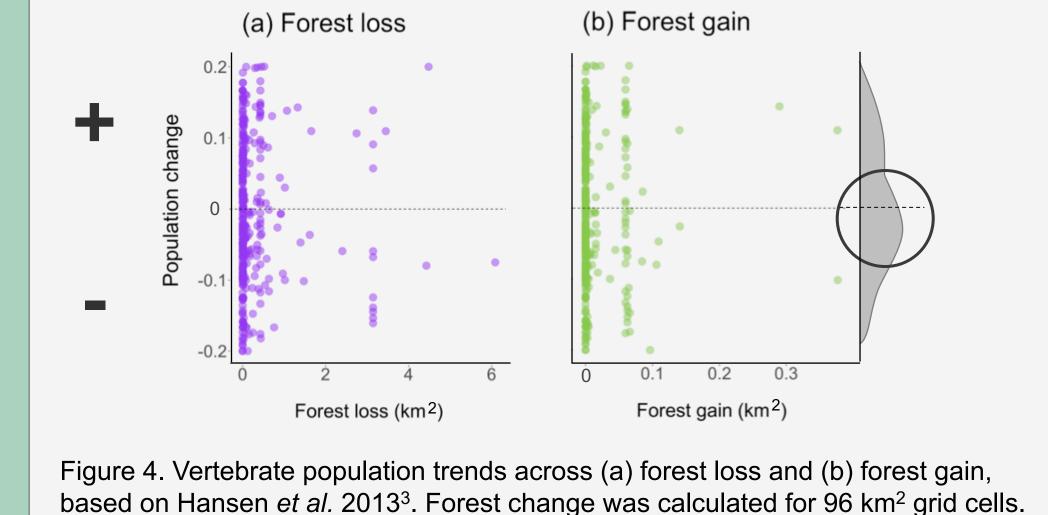


Figure 3. Global vertebrate trends among taxa (a) and duration of taxa monitoring (b).

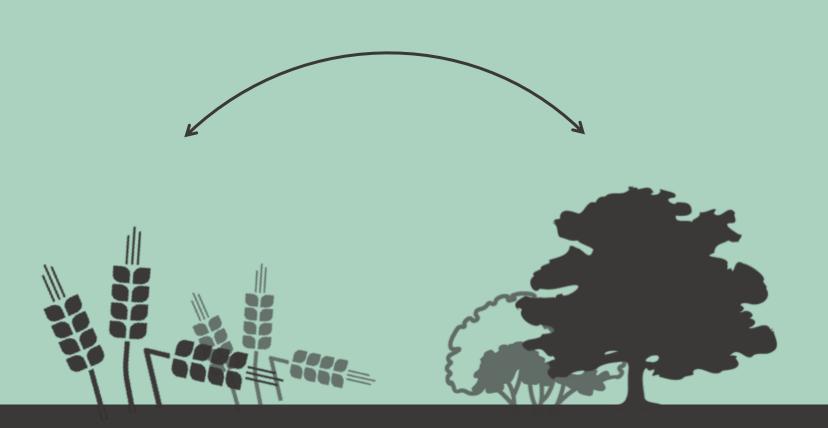
VIA LOCAL EXTINCTIONS AND COLONISATIONS

DO FOREST LOSS AND GAIN **INFLUENCE VERTEBRATE POPULATIONS?**





Both forest loss and gain correspond to more negative than positive population trends.



FUTURE STEPS

MULTIPLE DRIVERS

I will test the interaction between land-use and climate change.

Hypothesis: Climate change increases the effects of land-use change on populations.

BIODIVERSITY

Biodiversity metrics will include species richness, beta diversity (changes in composition over time) and community similarity.

COMPOSITION





RICHNESS

SIMILARITY

Downloaded Feb 2015

cover change. Science 342, 850-853.

REFERENCES

1. LPI 2016. Living Planet Index database. 2016. www.livingplanetindex.org.

2. Daskalova, Myers-Smith & Godlee (2018). Rarity and conservation status do not predict vertebrate population trends. bioRxiv, 272898. https://doi.org/10.1101/272898 3. Hansen et al. (2013). High-resolution global maps of 21st-century forest