

# PREDICTS Newsletter Special



## Projecting Responses of Ecological Diversity In Changing Terrestrial Systems

### *Nature* article out today: Global effects of land use on local terrestrial biodiversity

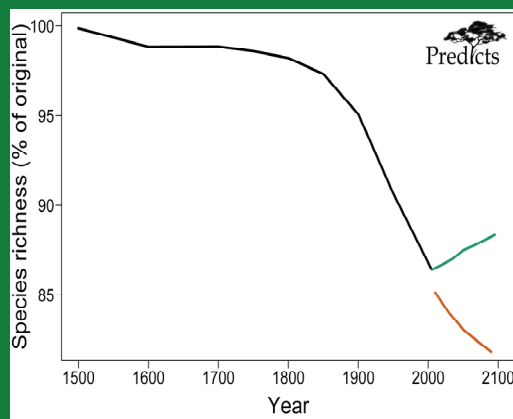
The first global analysis of the PREDICTS database has been published in this weeks' *Nature*, including nearly all of the data we had uploaded by March 2014. The paper is at [Nature](#)- here is the quick version:

- ◆ **Human-driven land use caused a loss of 13.6% of local biodiversity worldwide** by 2005.
- ◆ Our analyses included **over 1.1million records** for 27,000 species collected at 11,500 sites across 72 countries (see "The data"). **Each site was scored for six human pressures:** land use and use intensity, land-use history, human population density, proximity to roads, and accessibility from the nearest large town.
- ◆ The **numbers of species observed at a site depend strongly on land-use** (Figure 1), as shown by mixed-effects modelling.
- ◆ Most of the past losses in local biodiversity—around 10% - occurred in the last century, based on analyses using historical estimates of human pressures to see how average losses have changed over time (Figures 2 & 3).
- ◆ Future local biodiversity loss will depend on the path chosen. Under the worst scenario — with no climate mitigation — biodiversity loss will continue unabated (red line in Figure 2), but the best — in which climate change is mitigated through a strong carbon market (blue line in Figure 2) — can undo the last 50 years of biodiversity loss by 2100.
- ◆ Moving from the global to the national level, under the worst-case scenario local species loss is particularly severe for biodiverse but poor countries, but **under the best scenario local biodiversity will increase in nearly every country, whether rich or poor.**
- ◆ Our results suggest that **development can be sustainable for biodiversity, if we make the right choices.**

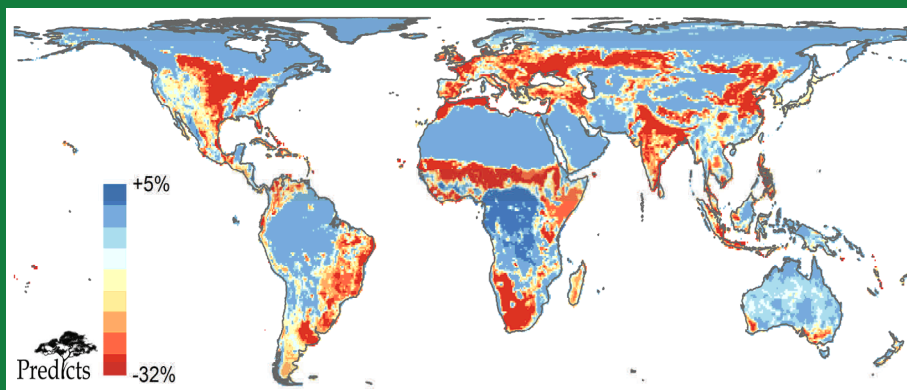
*Prof Andy Purvis, Natural History Museum London*



**Figure 1:** Relative species richness in different land uses. Modified from Newbold, Hudson et al. 2015



**Figure 2:** Change in mean local species-richness from 1500-2000 (black line), and projected to 2100 for two land-use scenarios—'business as usual' (red line) and 'carbon market' (green line). Modified from Newbold, Hudson et al. 2015



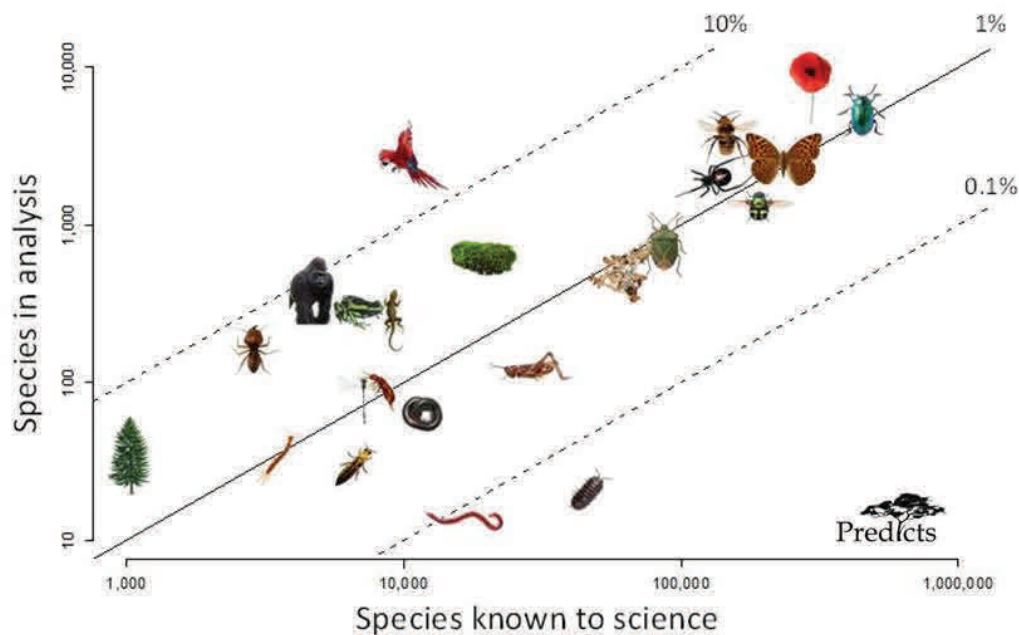
**Figure 3 :** Worldwide modelled pattern of loss of local species richness. Values of averages within 0.5-degree grid cells. Modified from Newbold, Hudson et al. 2015

## The data

Because so many researchers have generously shared their field data with us, the PREDICTS database holds a much more even sample of the world's terrestrial biodiversity than has been available for any previous modelling attempts. Although there are inevitably still big gaps, the most diverse taxa are the ones with most species in the database (Figure 4). This matters, because some taxa are probably more sensitive to human impacts than others: if the database didn't reflect overall diversity, the results from analysing it would be biased.

Similarly, the most ecologically important biomes are the ones from which we have most sites.

A full description of the data was published in *Ecology and Evolution* and we'll be making all the biodiversity data from the paper – and lots more besides – freely available later this year, through the Natural History Museum's data portal. The portal already has the site-level metadata for all the datasets in the database paper – at <http://dx.doi.org/10.5519/0018993>.



**Figure 4**  
Taxonomic representativeness of the PREDICTS database.

## LINKS

To read the News story on the Natural History Museum's site:

<http://www.nhm.ac.uk/about-us/news/2015/april/major-study-shows-biodiversity-losses-can-be-reversed134275.html>

To see the NHM's feature article: <http://www.nhm.ac.uk/our-science/our-work/biodiversity/big-data-on-biodiversity.html>

To explore the country-level estimates: type the country name in to <http://www.unep-wcmc.org/>

For answers to some frequently-asked questions about the paper: [http://www.predicts.org.uk/global\\_analysis\\_qanda.html](http://www.predicts.org.uk/global_analysis_qanda.html)

To see what people are saying about the paper on Twitter, search for **#PredictsProject**



#Predictsproject

Contact email: [enquiries@predicts.org.uk](mailto:enquiries@predicts.org.uk)

Thanks to Domenico Tozzi for producing the PREDICTS logo.

[www.predicts.org.uk](http://www.predicts.org.uk)