Biodiversity and Economic Land Use

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Abstract:

Changing patterns of economic land use are believed to be one of the major causes of global biodiversity loss (Newbold *et al.* 2015). At the same time it is widely argued that phylogenetic or evolutionary distinctiveness is the preferred measure of biodiversity, allowing policymakers the ability to prioritise conservation strategies (Weitzman 1993). This paper is the first to statistically quantify the impact of economic land use on phylogenetic diversity. More specifically, we construct phylogenetic diversity indices for bird populations throughout the entire USA and match them to high resolution land use data. We find that agricultural land decreases phylogenetic diversity. In contrast, urban land use initially encourages diversity however once 27% of the local area is urbanised phylogenetic diversity falls. Using a measure of the fractionalisation of land use we also find that local phylogenetic diversity benefits from the presence of a variety of different land use types, up to a point. Using existing estimates of projected land use changes until 2051, our findings imply a potential 13% reduction in phylogenetic diversity. Back of the envelope calculations using current land prices and a number of simplifying assumptions suggest land purchases to prevent future conversion would cost in the region of US$ 980 billion.

Keywords: biodiversity, economic land use, phylogenetic diversity

JEL codes: Q57, R14, Q15, Q24