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# Modelling the Effect of Biomass Appropriation for Human Use on Global Biodiversity

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**Abstract :** Due to population growth and changing patterns of production and consumption, the demand for natural resources and, as a result, the pressure on Earth's ecosystems are growing. Biodiversity mapping can be a useful tool for assessing species endangerment or detecting hotspots of extinction risks. This paper explores the benefits of using the change in trophic energy flows as a consequence of the human alteration of the biosphere in biodiversity mapping. To this end, multiple linear regression models were developed to explain species richness in areas where there is no human influence (i.e. wilderness) for three taxonomic groups (birds, mammals, amphibians). The models were then applied to predict (I) potential global species richness using potential natural vegetation (NPPpot) and (II) global 'actual' species richness after biomass appropriation using NPP remaining in ecosystems after harvest (NPPeco). By calculating the difference between predicted potential and predicted actual species numbers, maps of estimated species richness loss were generated. Results show that biomass appropriation for human use can indeed be linked to biodiversity loss. Areas for which the models predicted high species loss coincide with areas where species endangerment and extinctions are recorded to be particularly high by the International Union for Conservation of Nature and Natural Resources (IUCN). Furthermore, the analysis revealed that while the species distribution maps of the IUCN Red List of Threatened Species used for this research can determine hotspots of biodiversity loss in large parts of the world, the classification system for threatened and extinct species needs to be revised to better reflect local risks of extinction.

**Keywords :** biodiversity loss, biomass harvest, human appropriation of net primary production, species richness
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