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Global biodiversity monitoring: From data sources to Essential Biodiversity Variables

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Abstract

Essential Biodiversity Variables (EBVs) consolidate information from varied biodiversity observation sources. Here we demonstrate the links between data sources, EBVs and indicators and discuss how different sources of biodiversity observations can be harnessed to inform EBVs. We classify sources of primary observations into four types: extensive and intensive monitoring schemes, ecological field studies and satellite remote sensing. We characterize their geographic, taxonomic and temporal coverage. Ecological field studies and intensive monitoring schemes inform a wide range of EBVs, but the former tend to deliver short-term data, while the geographic coverage of the latter is limited. In contrast, extensive monitoring schemes mostly inform the population abundance EBV, but deliver long-term data across an extensive network of sites. Satellite remote sensing is particularly suited to providing information on ecosystem function and structure EBVs. Biases behind data sources may affect the representativeness of global biodiversity datasets. To improve them, researchers must assess data sources and then develop strategies to compensate for identified gaps. We draw on the population abundance dataset informing the Living Planet Index (LPI) to illustrate the effects of data sources on EBV representativeness. We find that long-term monitoring schemes informing the LPI are still scarce outside of Europe and North America and that ecological field studies play a key role in covering that gap. Achieving representative EBV datasets will depend both on the ability to integrate available data, through data harmonization and modeling efforts, and on the establishment of new monitoring programs to address critical data gaps.

Keywords: Essential Biodiversity Variables, biodiversity monitoring, data sources, biodiversity indicators, sa

Full text

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