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BIODIVERSITY-ECOSYSTEM FUNCTION RESEARCH: Is It Relevant to Conservation?

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■ **Abstract** It has often been argued that conserving biodiversity is necessary for maintaining ecosystem functioning. We critically evaluate the current evidence for this argument. Although there is substantial evidence that diversity is able to affect function, particularly for plant communities, it is unclear if these patterns will hold for realistic scenarios of extinctions, multitrophic communities, or larger spatial scales.

Experiments are conducted at small spatial scales, the very scales at which diversity tends to increase owing to exotics. Stressors may affect function by many pathways, and diversity-mediated effects on function may be a minor pathway, except in the case of multiple-stressor insurance effects. In general, the conservation case is stronger for stability measures of function than stock and flux measures, in part because it is easier to attribute value unambiguously to stability and in part because stock and flux measures of functions are anticipated to be more affected by multitrophic dynamics. Nor is biodiversity-ecosystem function theory likely to help conservation managers in practical decisions, except in the particular case of restoration. We give recommendations for increasing the relevance of this area of research for conservation.

INTRODUCTION

The past decade has seen a flurry of ecological research on the effects of biodiversity on ecosystem functions. The biodiversity-ecosystem function (hereafter BDEF) hypothesis posits that a reduction in biological diversity (variety of species, genotypes, etc.) will cause a reduction in ecosystem-level processes. Although the BDEF hypothesis has deep academic and philosophical roots (reviewed by Hector et al. 2001, Naeem 2002), it became widely discussed by ecologists in the early 1990s as the result of seminal conferences (Schulze & Mooney 1993), international collaborations (Heywood & Watson 1995, Jones & Lawton 1994), and

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