INVASION, DOMINANCE AND SPECIES LOSS IN WISCONSIN FOREST UNDERSTORIES

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Species invasions are simultaneously a critical force in maintaining native species diversity, yet also a major conservation threat when the invading species is not native to the system. and thus presents a paradox to resource management. To address this issue, we use a unique fifty-five year old baseline dataset to investigate both native and non-native invasions of Wisconsin forests and they role such invasions play in influencing native understory diversity and composition. We compare original species richness and composition, local environmental variables and surrounding landscape conditions to estimates of native and non-native species invasion for 240 forested stands throughout Wisconsin. For non-native species, initial species richness and landscape measures of human dominance were the best predictors of species invasion. Richer sites in the original survey were less likely to be invaded by exotic species, though this trend was dwarfed by a strong positive correlation with indices of urbanization. For native species invasions, large patches in unfragmented landscapes were more likely to recruit new native species than small patches in highly fragmented or urbanized landscapes. Such invasions were twice as important as extinctions in explaining species losses over the last fifty-five years in Wisconsin forests, supporting the idea that native species invasions are critical to diversity maintenance. Overall, exotic species invasion had no significant correlation with native species losses – perhaps suggesting that, for Wisconsin upland forests, exotic invasion is more a symptom than a cause of declines in native species richness and quality.

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