

THE INFLUENCE OF HABITAT AND LAND USE ON THE DISTRIBUTION AND ABUNDANCE OF EXOTIC PLANTS IN THREE GREAT LAKES NATIONAL PARKS. Noel B. Pavlovic, Stacey A. Leicht-Young, and Ralph Grundel, Ecologists, U.S. Geological Survey, Porter, IN 46304.

Understanding patterns of exotic species distribution across a landscape is the first step to successful exotic plant management. With this in mind, we sampled exotic and native plants at Indiana Dunes (N = 900 plots), Pictured Rocks (N = 1120), and Sleeping Bear Dunes (N = 1244) National Lakeshores from 1998-2000. Random transects with three plots were located across major vegetation strata. In each plot we assessed the frequency score of groundlayer species in seven nested subplots within a 4 by 2 m frame. Basal area of the five largest trees and identity of all shrubs and trees within 10 m radius were recorded. The contrast in exotic frequency among Picture Rocks (11% plots with exotics), Indiana Dunes (52%), and Sleeping Bear Dunes (46%) was likely the result of differing land use history. Pictured Rocks was logged and abandoned while the other two parks were logged earlier and had a longer history of agricultural and residential land use. To determine if the differences in exotic plant frequency between parks were due to land use history, we used correlation analysis and hierarchical partitioning to examine the relationships between richness of exotic species per plot and environmental, habitat, spatial trends, successional, and human disturbance variables across the latitudinal gradient represented by the three parks. Where present, exotics were nearly twice as dense at Sleeping Bear (4.37 ± 0.15 species per plot) than at Indiana Dunes (2.46 ± 0.17) and at Pictured Rocks (2.34 ± 0.09). The proportion of exotic richness explained by human disturbance versus environmental factors varied inversely with latitude. The importance of habitat, spatial trend, and succession in explaining exotic richness were relatively constant across the latitudinal gradient but successional variables were more important than habitat and spatial trends. These results confirm that the latitudinal gradient in exotic richness is related to human activity on the landscape.