

ECOLOGICAL CONSEQUENCES OF EXOTIC INVADERS: INTERACTIONS INVOLVING EUROPEAN EARTHWORMS AND NATIVE PLANT COMMUNITIES IN HARDWOOD FORESTS. Cindy Hale, The Natural Resources Research Institute, University of Minnesota Duluth, Duluth MN 55811

European earthworm species have been invading hardwood forest ecosystems in the northern tier of states in the U.S. These hardwood forests have developed since the last glaciation in the absence of native earthworms, and many stands historically had thick forest floor layers, that served as rooting medium for many species of forest herbs and tree seedlings. The exotic earthworms consume the forest floor layer, sometimes leaving exposed mineral soil. Some forest stands have been observed with only one species of native herb and virtually no tree seedlings remaining. Therefore, concerns have been raised about the widespread loss of native forest plant species and the stability of hardwood- forest ecosystems in the western Great Lakes region. The results of three major studies conducted over the last 6 years will be summarized including the dynamics of change across leading edges of earthworm invasion, differential responses or consequences of earthworms among different forest communities, and landscape patterns of earthworm invasions and their impacts. Invasion of hardwood forests by European earthworms is occurring throughout the range of this ecosystem in North America. Local control of invasions into currently worm-free areas may be possible in some situations. However, the magnitude and regional scale of European earthworm invasions that have already occurred suggests that in the next few decades a majority of hardwood forests will be impacted to some degree by earthworms. Research related to the patterns, mechanisms and potential indirect effects of earthworm invasions will be invaluable in directing development of management priorities and strategies.