

ABSTRACT

THESIS: How will EAB change our forests? Predicting forest canopy gaps using GIS

STUDENT: Stephanie Schuck

DEGREE: Master of Science

COLLEGE: Sciences and Humanities

DATE: May, 2013

PAGES: 78

Invasive plants, animals, insects, and pathogens are a significant problem for land managers and conservationists as they can cause irreparable damage to local ecosystems. The emerald ash borer (EAB), an invasive beetle from China, was discovered in the U.S. in 2002, and has decimated ash populations throughout Michigan. It continues to move through Midwestern and some eastern states, usually killing a tree within 2-4 years of infection. Using a Global Positioning System (GPS) and Geographic Information System (GIS), all trees ≥ 45 cm and all ash ≥ 30 cm in diameter were measured and mapped within a 160 acre old-growth deciduous forest in northern Indiana. EAB was detected in 14 trees throughout the forest. A canopy map was generated, estimating 6.6 percent canopy loss due to EAB. Because of this research, the entire spread of EAB within this forest can now be documented and mapped. The methodological framework used in this research can assist land managers and property owners monitor their land by enabling them to: track changes in tree health more accurately; assess damage by creating forest inventory and canopy maps; and model potential damage over time.