



Asian Longhorned Beetle Behavior in Forests of Worcester, Massachusetts

Kevin J. Dodds¹ and David A. Orwig²

¹U.S. Forest Service, Durham, NH

²Harvard Forest, Harvard University, Petersham, MA

ABSTRACT

Asian longhorned beetle (ALB), *Anoplophora glabripennis* was detected in Worcester, Massachusetts in 2008 and has subsequently been located in several city forests. Two forest stands were surveyed to estimate the vegetation present in each stand and assess ALB activity. Results suggest ALB attempts to colonize all size classes of available host trees present in a stand. In one stand, red maple was the most abundant tree species and was also attacked more frequently than Norway or sugar maple. Eradication efforts in a nearby natural area have shifted forest composition from a red maple dominated stand to an oak-hickory forest. Further studies are planned to determine potential impacts ALB will have in natural forests.



Photo: Mike Bohne, USFS

CONTACT

Kevin Dodds
U.S. Forest Service
kdodds@fs.fed.us
(603) 868-7743

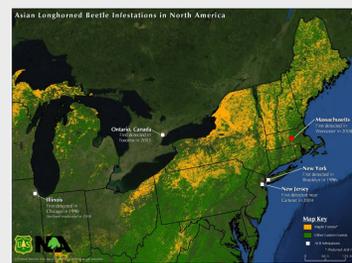


INTRODUCTION

Asian longhorned beetle (ALB), *Anoplophora glabripennis*, was detected in Worcester, MA in 2008. This infestation is different than previous detections in the U.S. in that it is adjacent to large areas of natural forest containing maple (Figure 1). ALB has been detected in several Worcester forests that allow for observation of this insect under more natural conditions compared to previous infestations in urban areas. Studies are ongoing, but objectives outlined here include:

1. Describe ALB behavior in forest stands
2. Describe stand structure in ALB-infested forests and changes occurring from eradication efforts

Figure 1. ALB infestation history in North America and distribution of maple forests in the U.S.



METHODS AND MATERIALS

Study Sites

Delaval – mixed hardwood forest; sugar, red, and Norway maple present, approximately 5 hectares, sampled fall 2009, still standing

Bovenzi – mixed hardwood forest, approximately 40 hectare natural area, sampled December, 2008, host tree removal during winter, 2009

Forest Stand Surveys

- All host trees surveyed by tree climbers to detect signs of ALB
- Fixed radius plots randomly placed throughout stands
- Tree diameter (>7.5 cm), species, crown class, crown damage, and ALB presence/absence recorded for each tree

Stem Mapping

- All infested and non-infested host trees, and non-host trees were mapped in Delaval using sub-meter GPS

RESULTS

Delaval Tract

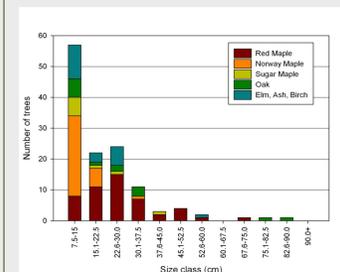


Figure 2. Size class distribution of trees ≥ 7.5 cm dbh present in the Delaval stand

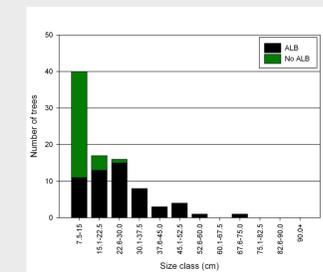


Figure 3. Size class distribution of maple trees with and without signs of ALB attack in the Delaval stand

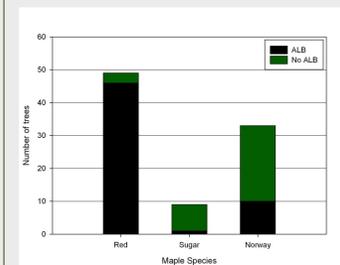


Figure 4. Incidence of ALB presence by maple species in the Delaval stand



Figure 5. Stem map of trees within a portion of the Delaval tract

Bovenzi

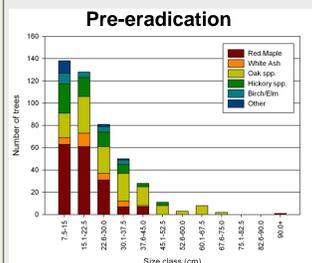


Figure 6. Size class distribution of trees ≥ 7.5 cm dbh present in Bovenzi prior to eradication efforts

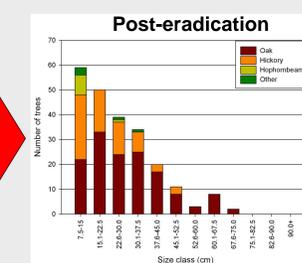


Figure 7. Size class distribution of trees ≥ 7.5 cm dbh present in Bovenzi after eradication efforts

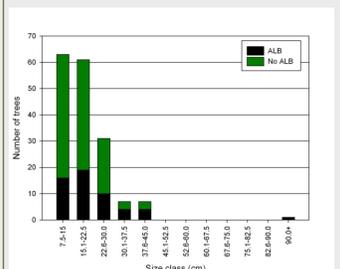


Figure 8. Maple trees with and without signs of ALB attack in Bovenzi

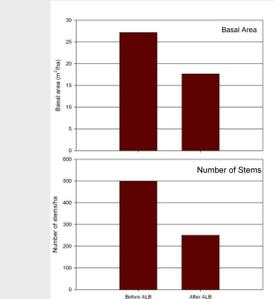


Figure 9. Basal area and number of stems before and after ALB eradication efforts in Bovenzi

KEY FINDINGS

Delaval

- Red maple, Norway maple, and oak were the most important trees present (Figure 2)
- ALB was found in all size classes of maple present in the stand. 100% of maples > 30 cm were infested (Figure 3)
- Red maple was the most frequently attacked maple, followed by Norway and sugar (Figure 4)
- Infested trees are distributed throughout the stand (Figure 5)
- 62% of the maples had signs of ALB attack

Bovenzi

- Red maple, oak spp., and hickory spp. were the most important trees present prior to eradication efforts (Figure 6)
- Post-eradication stand structure shifted from maple dominated to an oak (red/black/white) hickory forest (Figure 7)
- ALB was found in all size classes of maple present in the stand (Figure 8)
- 35% of basal area and 50% of stems were removed during the eradication effort (Figure 9)
- 32% of the maples had signs of ALB attack

ACKNOWLEDGEMENTS

We wish to thank Ken Gooch (MA DCNR) and Clint McFarland (USDA APHIS) for help accessing the sites; various APHIS and USFS tree climbers diligently surveyed the stands, and Garret Dubois, Mike Bohne, Dennis Souto, Bob Cooke, and Angie Hammond (USFS) for assistance conducting field work. This project was supported by the Northeastern Area State and Private Forestry.