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Title:

From Forestry Management Actions to a Planning Framework to Mitigate Emerald Ash Borer: A Case Study of Boulder, Colorado

Abstract:

Emerald Ash Borer (EAB) infestation has become a prominent urban forestry and planning issue, killing hundreds of millions of ash trees in the US and threatening an estimated 7.5 billion ash trees across the country (Gulick, 2014). Boulder, Colorado is now struggling with this issue and will lose 25% of its tree canopy to EAB in the next five years (City of Boulder, 2018). Literature on urban resilience has mainly focused on devastating natural hazards and terrorist events. Very little of the literature addresses the unique needs and characteristics of cities under stresses like tree diseases and insect infestation (Godschalk, 2003). Municipalities have different approaches to responding to tree infestation and its consequences. Some cities solely take responsibility for trees on public lands (Sadof, Hughes, Witte, Peterson, & Ginzel, 2017). Other cities use forestry management techniques, such as diversifying planted species (Carrus et al., 2015). Mitigation efforts, however, necessitates a more holistic approach to the issue that garners support from all public, and private stakeholders (Tidball & Krasny, 2007). This study investigated how a population's baseline knowledge about trees, their home ownership status, as well as their level of civic engagement affected EAB mitigation efforts across neighborhoods in Boulder. Accordingly, we developed a planning framework that links education and collaborative efforts to effective management of threats to the urban tree canopy. The results of this research can inform the City of Boulder and other municipalities about factors that influence the effectiveness of urban forestry practices.

This project was conducted in partnership with the City of Boulder. We applied a mixed methods approach. First, we conducted a population-based survey to gauge Boulder residents' baseline knowledge about urban trees, and their awareness of the EAB. The survey included sections on home-ownership and tree management efforts. Next, we interviewed 15 homeowners and key-informants to obtain in-depth knowledge about public-private partnership and planning efforts to address tree threats in Boulder. We also utilized GIS data about the spread of EAB, impervious areas, and socio-economic status across Boulder. We applied both quantitative and qualitative methods to interpret these data and make conclusions about adaptive capacities and responses post-disturbance.

Preliminary results suggest that income at the neighborhood level and people's knowledge about trees are positively associated with EAB mitigation practices across Boulder. We did not find a significant association between homeownership and awareness of the EAB. Our model suggests that a successful campaign engages citizens, homeowner associations, educational institutions, and other non-governmental organizations. In order to optimize urban forestry practices, cities should integrate social marketing and environmental education efforts to motivate private actors to maintain and restore the urban tree canopy.

Keywords:

Emerald Ash Borer, Planning framework, Urban forestry, civic ecology,

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The audience will learn how residents' baseline knowledge about trees, their home ownership status, as well as their level of civic engagement can affect Emerald Ash Borer mitigation efforts at the municipality level.

The audience will also learn more about the application of educational programs and public-private partnerships in effective management of threats to the urban tree canopy.