US EPA ARCHIVE DOCUMENT
Abstract

Riparian zones are productive ecological systems that are highly susceptible to invasions by non-native plant species. Invasive species can alter community structure and function, reduce biodiversity, and increase vulnerability to disturbance. They also compete with native species, may reduce the productivity of native species, and affect ecosystem services. In this study, we evaluated the effects of residential land use (RLU) on riparian vegetation and associated bird species. We sampled riparian sites along 100-m stream reaches in Rhode Island, USA, and analyzed the vegetation and bird species composition. Our objective was to determine if there was a correlation between the percentage of residential land use and the diversity of native plant species and bird species. We hypothesized that as the percentage of residential land use increased, the diversity of native plant species and bird species would decrease. Our results showed that overall riparian vegetation cover and density decreased with increasing residential land use, while invasive species richness and cover increased. With increasing urbanization, available bird habitat within the watersheds was altered; canopy habitat was reduced and edge habitat increased, resulting in a change of species composition of breeding birds.

Methods

Sampling design for random transects

1. Delineate watershed with GIS
2. Establish random transects using 100-m stream reaches
3. Measure sampling plots
4. Identify and record species at each of three vegetation layers

Results

1. Vegetation decreased at all layers with increasing % residential land use (RLU)
2. Percent invasive species increased with % RLU
3. Density of invasive cover directly correlated with increasing % RLU
4. Bird habitat was altered, favoring edge species but not forest birds

Summary

- Increased %L of residential land use resulted in decreased native plant species diversity
- Increased %L also reduced bird species diversity and richness
- Maintaining riparian areas in a natural state is essential for preserving biodiversity
- Watersheds with low development and fragmentation are good candidates for preservation