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Invasive Species Facilitation in Bioswales and Rain Gardens in Greater Cleveland

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Abstract

Stormwater management features such as bioretention systems and rain gardens provide valuable ecosystem services. They are ecologically engineered to counteract surrounding urban land use practices. However, new stormwater management features may also create an environment for invasive plant species. Invasive plants can affect ecosystem services, and have devastating economic impacts. This study was conducted to determine connections between surrounding land use and maintenance practices in stormwater management features throughout Greater Cleveland and the presence of invasive plant species. Initial site visits were conducted for 164 bioretention systems and rain gardens in Greater Cleveland. They were analyzed for physical characteristics, surrounding land use, and overall function, including level of erosion and exposed soils. An initial survey recorded all plants present, including invasive species, and a later revisit was made to each site to obtain a final plant survey. We predict a correlation between invasive species presence and increased impervious surface and surrounding land use heavily dominated by human activities, as well as poor maintenance practices. The presence of invasive plant species is also predicted to impact the ability of the stormwater management system to function properly and provide the valuable ecosystem services as originally intended.