Loss of structure and diversity may lead to - Loss of plant species - Changes in/loss of native ecosystems - Loss of canopy - Changes in midcanopy openness - Changes in views **Vegetation Structure** and Diversity Shrubs Multiflora Rose (Rosa multiflora)/ **Insect Diversity Charismatic Bird** Diversity and Abundance Historic Landscape

- In a long-term study of successional dynamics, cover of red maple (A. rubrum) and eastern redcedar (J. virginiana) were found to be inversely related to changes in multiflora rose cover,
 → indicating the species had an inhibitory effect on the growth of on one another (Banasiak & Meiners, 2009). Over time this may lead to changes in ecosystem structure as dominant tree
- Multiflora rose can grow as a vine or shrub, giving it the ability to both cover canopy trees or create new canopy, therefore changing or eliminating most or all layers of vegetation below
 (www.natureserve.org Swearingen, pers. comm., 2001).

species are lost.

- Mulitflora rose may form monocultures and displace native species in open woodlands, forest edges, prairies, and savannas (www.natureserve.org Swearingen, pers. comm., 2001).
- Multiflora rose can provide greater cover for foraging seed predators, therefore leading to greater seed discovery and removal (Meiners & LoGuidice, 2003; Meiners, 2007), potentially leading to changes in canopy forming tree density, community structure, or species composition.
- During a study of the invasion dynamics of both invasive and native plant species in abandoned agricultural fields, four invasive shrub species, including multiflora rose, were associated with declines in species richness (all plant species present in sampling plots) while invasion by natives did not cause changes in species richness (Meiners et al., 2001).
- Amur honeysuckle (L. maackii) residence time has been negatively associated with the density of tree seedlings though reduced light levels and resource competition. Allelopathic toxins produced by this species reduce native plant growth (Collier et al., 2002), potentially leading to loss of canopy forming trees.
- Japanese barberry (B. thunbergi) forms dense stands that suppress growth co-occurring herbaceous species (Silander & Klepeis, 1999), potentially leading to loss of natives.
- Common buckthorn (R. cathartica) can comprise up to 50% of understory plants and the
 → resulting leaf litter causes bare soil conditions beneath stands leading to loss of biomass and changes in ecosystem structure (Knight et al, 2007).
- Barberry (B. thunbergi) can both change soil characteristics and form dense monocultures, making it hard for native understory plants to re-establish (www.natureserve.org, www.nps.gov/plants/alien/pubs/midatlantic/toc.htm) leading to a change in community structure or loss of species.
- Pitfall analysis has shown that multiflora rose shrubs support fewer insect species (Clifford & Litvaitis, 2004).
- Foodweb analysis predicts loss of insect biomass as large insects on native plants are
 replaced by smaller insects on alien trees and shrubs. Analysis predicts a decrease in insect productivity by over 67% (Heleno et al., 2008).
- Invasion by the European shrub gorse (U. europaeus) influences the assemblage of insect
 and diptera taxa. Assemblage of selected species was found to change with shrub invasion, with many species being unique to each habitat (Harris et al., 2004).
- Lesser periwinkle (V. minor) invasion has been shown to change spider guild, family
 structure, and abundance through modification of the forest floor structure (Bultman & DeWitt, 2008).
 - Predation rates for songbirds nesting in multiflora rose were greater than those for songbirds birds nesting in native shrubs. This is likely due to reduced nest height and larger shrub volume surrounding the nests buit within stands of multiflora rose (Borgmann & Rodewald, 2004).
 - Invasion by multiflora rose is known to influence the abundance and distribution of both

 → migratory and frugivorous birds. Depending on surrounding habitat characteristics, invasion may enhance bird habitat (Suthers et al., 2000; Drummond, 2005; McGranahan et al., 2005).
 - For the American robin, dense branch architecture and lowered nest height led to increased nest predation when birds nested in an exotic shrub (amur honeysuckle, L. maackii) (Schmidt & Whelan, 1999). Both of these characteristics are seen in multiflora rose, idicating robins may experience increased nest predation when nesting in multiflora rose as well.
 - Veeries that nested in barberry (B. thunbergi) had greater success due to the plant structure → (presence of thorns and greater nest height). Indicates that the invasive form is important (Schmidt et al., 2005).
- Due to its ability to form dense monocultures and thickets not seen in historic landscapes,

 → multiflora rose changes the character and look of the forest understory in noticeable ways

 (www.natureserve.org Swearingen, pers. comm., 2001; Meiners et al., 2001).