

BROWN COUNTY NATIVE WOODLANDS PROJECT

Brown County Roadside Invasive Species Mapping Project

Patrick Selby

September 13 2008

Funded by: The Nature Conservancy and the Brown County Soil & Water Conservation District

Non-native invasive plant species threaten natural areas by outcompeting native plants for sunlight, soil, and water resources. Annually, invasive species cost the United States \$35 billion. They destroy natural areas, pose a threat to biodiversity and interrupt natural processes and ecosystems. According to the book, Invasive Plants of the Upper Midwest, invasive plants lead to soil instability and an increase in runoff due to a loss of groundlayer vegetation. (Czarapata, 3) Non-native invasive plants species also decrease the seasonal beauty and natural heritage of the area they invade. Try to picture Brown County without spring wildflowers or vibrant fall colors. Even now there are places in Brown County where dense stands of Asian bush honeysuckle's out compete all native vegetation and through an allelopathic reaction suppress native wildflowers. There are also places where Tree-of-Heaven with its yellow fall foliage that drops in mid-September is changing the fall scenery of the Brown County Hills. These visible changes are what most people see, but many of the real changes require a closer look. In dense stands of Asian Bush Honeysuckle on hillsides, sheet and rill erosion can occur due to the degradation of groundlayer vegetation. According to the book Invasive Plants of the Upper Midwest, Japanese Knotweed thickets are "particularly problematic...and can limit access for fishing and wildlife, and cause flooding by decreasing water flow through rivers." It can also "spread by rhizomes forming large, dense thickets that eliminate native vegetation and wildlife habitat...the rhizomes are strong enough to damage pavement." (Czarapata,74)

In early 2007 The Brown County Native Woodlands Project, a not for profit group aimed at protecting native biodiversity in Brown County forests, wanted to take the first step in targeting non-native invasive plant species. The group decided to focus on the occurrence of Asian bush honeysuckles, Japanese knotweed, autumn olive, and tree-of-heaven. Though these are not the only non-native invasive plant species affecting Brown County, they felt it was important to target these first because of their forest invading characteristics. The group targeted non-native invasive plant species that threaten woodlands, as in the case of honeysuckles, Tree-of-Heaven, and Autumn Olive, as well as riparian zones and edges in the case of the Japanese Knotweed. It was felt that two of these species, Japanese Knotweed and Tree-of-Heaven were not yet irreversibly established, and with a comprehensive management plan, they could be eradicated in Brown County.

The first step in combating invasive species in an area is to find out where they are, to plot there location on a map. In order to map the entire county, plotting the location of non-native invasive plants along the roadsides seemed like an efficient initial strategy. This is efficient and accurate because most invasive species prefer disturbed or edge-like areas that have open space, and abundant sunlight, such as roadsides. Mapping the occurrence of non-native invasive plant species on roadsides provides a course overview of the occurrence of the four chosen species in the Brown County.

By mapping the occurrence of these four non-native invasive plant species in Brown County, the Brown County Native Woodlands Project hopes to create the foundation for a plan for the control and eradication of some of the non-native invasive plants species. This mapping project will serve as the foundation for future grant funds that can be used to help Brown County resident control these troublesome plants. Funding for this project by The Nature Conservancy and the Brown County Soil and Water Conservation District allowed the Brown County Native Woodlands Project to hire and intern to coordinate the mapping efforts and complete the project in a timely manner.

Asian Bush Honeysuckles

Amur honeysuckle, *Lonicera maackii* (Rupr.) Herder

Morrow's honeysuckle, *L. morrowii* Gray

Tatarian honeysuckle, *L. tatarica* L.

Sweet-breath-of-spring, *L. fragrantissima*

Asian bush honeysuckles were introduced to the United States from Asia in the 1700s and 1800s. They were mistakenly used as ornamentals and wildlife plants late into the 20th century. They were used along roadsides by the US Highway Department. Asian Bush Honeysuckles are deciduous, upright, arching-branched shrubs. The stems of Asian Bush Honeysuckles are opposite branched, light tan with braided-strand appearance. The bark is often flaky. Older branches are hollow. The leaves are opposite in two rows, ovate to oblong with rounded bases. The leaves persistent into winter. Asian Bush Honeysuckles flowers from February to June and have one to several white to yellow or pink to red flowers. They fruit from August to February, with abundant spherical, glossy berries paired in leaf axils. Asian bush honeysuckles form dense thickets in open forests, forest edges, abandoned fields, pastures, roadsides, and other open upland habitats. They are relatively shade tolerant. The plant colonizes by root sprouts and is spread by abundant bird- and other animal-dispersed seeds. They seeds can stay viable for long periods of time in the soil. (Czarapata, 32-35)

Japanese Knotweed

Polygonum cuspidatum

Japanese knotweed originates from eastern Asia and was probably introduced into the United States in the late 1800's. It was first planted as an ornamental and has also been used for erosion control and landscape screening. Knotweed is an upright, shrubby, herbaceous perennial that can grow to over 10 feet in height. Stems of Japanese knotweed are smooth, stout and swollen where the leaf meets the stem. Like all members of the family, it has a membranous sheath surrounding the joints of the stem. The leaves are normally about 6 inches long by 3 to 4

inches wide, broadly oval to somewhat triangular and pointed at the tip. Japanese knotweed has minute greenish-white flowers occur in attractive, branched sprays in summer and are followed soon after by small winged fruits. Seeds are triangular, shiny and very small. Japanese Knotweed spreads primarily by vegetative means with the help of long, stout rhizomes. It can be transported to new sites by water, wind, as a contaminant in fill-dirt, or on the soles of shoes. It often escapes from neglected gardens and discarded cuttings. It can tolerate a variety of adverse conditions, including deep shade, high temperatures, high salinity and drought. Knotweed is commonly found near water sources, such as along streams and rivers, in low-lying areas, waste places and utility rights-of-way and around old home sites. It spreads quickly to form dense thickets that exclude native vegetation and greatly alter natural ecosystems. Japanese knotweed poses a significant threat to riparian areas, where it can survive severe floods and rapidly colonize scoured shores and islands. Once established, populations are extremely persistent. (Czarapata,73-75)

Tree of heaven

Ailanthus altissima

Tree of heaven is commonly referred to as ailanthus, Chinese sumac, stinking sumac, paradise-tree, copal-tree. The plant was introduced in 1784 from Europe, although it originates from Eastern China. It was used as an ornamental. The tree is deciduous, and can grow up to 80 feet in height and 6 feet in diameter. It has long pinnately compound leaves and circular glands under lobes on leaflet bases. There is a strong odor from flowers and other parts, sometimes likened to peanuts or cashews. The twigs are stout, chestnut brown to reddish tan, and smooth-to-velvety with light dots (lenticels) and heart-shaped leaf scars. Buds are finely hairy, dome-shaped, and partially hidden by the leaf base. Branches are light gray to dark gray, smooth and glossy, with raised dots becoming fissures with age. Bark light gray and rough with areas of light-tan fissures. The leaves are alternate, odd- or even-pinnately compound, 10 to 41 leaflets on 1- to 3-foot light-green to reddish-green stalks with swollen bases. The leaves have long tapering tips and lobed bases with one or more glands beneath each lobe. Tree-of heaven flowers from April to July. Large terminal clusters to 20 inches long of small, yellowish-green flowers, with five petals and five sepals. Male and female flower on separate trees. The tree fruits from July to February, with persistent clusters of wing-shaped fruit with twisted tips on female trees. These seeds can stay viable for long periods of time, persisting in the undergrowth, waiting for sunlight to reach the forest floor after some kind of disturbance. Tree-of-heaven grows rapidly, forming thickets and dense stands. It is both shade and flood intolerant and allelopathic. It colonizes by root sprouts and spreads by prolific wind- and water-dispersed seeds. Viable seed can be produced by 2- and 3-year-old plants. (Czarapata, 87-88)

Autumn Olive

Elaeagnus umbellata

Autumn olive was originally introduced from China and Japan in 1830. Since then it has been widely planted for wildlife habitat, strip mine reclamation, and shelterbelts. Its use was encouraged by the United States Department of Agriculture. Autumn olive is a deciduous bushy, leafy shrub, 3 to 20 feet in height, with scattered thorny branches. The leaves are silvery and scaly on the underside. The branches and main stems are glossy olive drab with scattered thorns and many whitish dots (lenticels), becoming light gray to gray brown with age and eventually fissuring to expose light-brown inner bark. Autumn olive produced silvery white to yellow flowers from February to June. It fruits from August to November with round, juicy berries containing one nutlet. The berries are red and finely dotted with silvery to silvery-brown scales. Autumn olive prefers drier sites. It is shade tolerant. It spreads by animal-dispersed seeds and found as scattered plants in forest openings and open forests, eventually forming dense stands. (Czarapata, 31-32)

Method

The mapping of the roads was done by a group of local volunteers with an intern coordinating their efforts. The mapping protocol was as follows: The mappers used an enlarged photocopy of a Brown County map with their assigned roads on it. The most efficient and effective way was to go out in teams of two. This way one person could focus on driving and pay attention to the road and local traffic, and the other can concentrate on scanning the roadsides. The mappers used 4 different colored markers, one for each species. The colors were pink- Asian bush honeysuckles, green-autumn olive, yellow-tree of heaven, and blue-Japanese knotweed. If a species was spotted on the roadside, a dot of relative color to that species was marked onto the corresponding location on the map. If numerous plants of the same species were present, a line could be used to represent contiguous areas of plants. On the GIS map, a line dictates the occurrence of the corresponding species in that location. It does not dictate a specific number of plants just that it occurred along the road in that area.

Results

The roadside mapping of Brown County warranted clear results about the distribution of the four species throughout the county. Autumn olive is very well established and widely spread throughout the entire county. The south east region of the county is especially infested. Asian bush honeysuckles were well established and spread throughout the county. The occurrence of honeysuckles was sporadic in some locations, but on the whole evenly distributed throughout the county. Tree of Heaven was the least recorded of the four species. Though there are almost certainly more occurrences that were not plotted, it is still accurate to say Tree-of-Heaven is not widely established, and its distribution at this time is sparse. Japanese Knotweed was found in less than 30 places along roadsides in the county. This non-native invasive plant species is not well established, but based on its presence near streams it is positioned to spread across large areas.

The results of the mapping project and the GIS map illustrate the occurrence of the four species in Brown County. Once established, most non-native invasive species cannot be completely eradicated, but a level of control can be achieved that allows native species to compete and remain viable plant communities. From the map it can be inferred that countywide control of the Asian bush honeysuckles and autumn olive would be prohibitively expensive and difficult to maintain. Control of these species in some areas is necessary and desirable if landowners wish to keep native plant communities in tact. Control efforts will be most successful in areas with lower infestations and where large blocks of land or neighbors are cooperating in a control effort. On the other hand, Japanese knotweed and Tree-of-heaven are not yet irreversibly established. With an aggressive control plan, Brown County could be nearly free of these species. With the control of any non-native invasive species, vigilance is required for the early detection and rapid response to new infestations of the controlled species or the introduction of a new invasive species.

Works Cited

Czarapata, Elizabeth J. *Invasive Plants of the Upper Midwest: An Illustrated Guide to Their Identification and Control*. Univ of Wisconsin Press, 2005