USDA United States Department of Agriculture

An Assessment of Japanese Honeysuckle in Northern U.S. Forests

Research Note NRS-202

This publication is part of a series that provides an overview of the presence of invasive plant species monitored on an extensive systematic network of plots measured by the Forest Inventory and Analysis (FIA) program of the U.S. Forest Service, Northern Research Station (NRS). Each research note features one of the invasive plants monitored on forested plots by NRS FIA in the 24 states of the midwestern and northeastern United States.

Background and Characteristics

Japanese honeysuckle (*Lonicera japonica*) is native to east Asia and arrived in Long Island, NY, in 1806. In 1862, a horticultural variety of Japanese honeysuckle, called Hall's honeysuckle, was found in Flushing, NY. This vigorous invader was promoted for wildlife habitat and erosion control as well as for a landscape plant; its sale is now illegal in some states (Kaufman and Kaufman 2007).

In open areas, such as abandoned fields and meadows, this vine can form a dense carpet. Within the forest, some animals use Japanese honeysuckle for forage and cover. However the vines can grow very dense and limit sunlight, degrade forest conditions by smothering the understory, girdle trees, and alter the forest composition. Dense vine growth can cause trees to break due to the added weight and stress. In addition, Japanese honeysuckle increases the fuel load and the likelihood of a crown fire by creating fuel continuity from the forest floor to the canopy. Aside from the negative environmental impacts, this vine has been found to possess medicinal qualities (Kurtz 2013).

Figure 1.—Japanese honeysuckle in flower. Photo by Chuck Bargeron, University of Georgia, Bugwood.org.

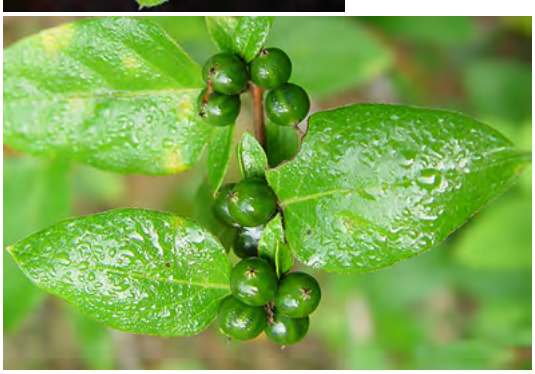

Figure 2.—Japanese honeysuckle fruit. Photo by Chuck Bargeron, University of Georgia, Bugwood.org.

Description

Growth: woody, perennial vine to 30 or more feet; simple, opposite leaves with smooth margins and short petioles.

Flowers: fragrant, tubular, white to yellow, paired (Fig. 1); spring.

Fruit: green fruits (Fig. 2) mature to black (native honeysuckles have red to orange fruits); animal-dispersed.

Reproduction: seed, rhizomes, suckers, runners.

Habitat: a wide variety of habitats, can form a dense layer in open areas such as fields and meadows; aggressive in forests.

Growth conditions: requires cold stratification, 24 to 60 inches of precipitation, low anaerobic tolerance, intolerant of coarse and calcareous soils, a minimum rooting depth of 10 inches, pH between 4.9 and 7.8, ≥130 frost free days, hardy to -13 °F.

Control: various mechanical and chemical methods, difficult to eradicate established colonies due to its ability to resprout from root fragments (Czarapata 2005, Kaufman and Kaufman 2007, NRCS 2014).

Range

Japanese honeysuckle is currently found in 39 states, one Canadian province (Ontario), and Puerto Rico (Fig. 3).

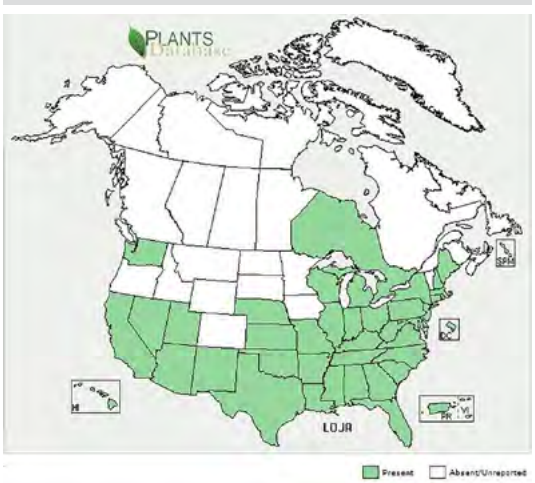

Figure 3.—Japanese honeysuckle, U.S. and Canada. (source: NRCS 2014)

Japanese Honeysuckle Presence on Phase 2 Invasive Plots

FIA crews visited 6,815 forested Phase 2 (P2) Invasive plots across the NRS region between 2009 and 2013. This 5-year cycle, where 20 percent of the plots are measured each year, is collectively labeled the "2013 inventory" and was used to produce this report. Forty invasive plant species[1] (IPS) (39 species and one undifferentiated genus [nonnative bush honeysuckles][2]) were monitored. On each of these plots, various attributes were collected including: the occurrence and coverage of IPS as well as the standard forest variables measured on P2 plots (e.g., tree diameter, height). Overall, 50.2 percent of forested plots had one or more of the monitored invasives present.

Japanese honeysuckle was the fifth most commonly observed invasive species, after multiflora rose, garlic mustard, reed canarygrass, and nonnative bush honeysuckles. This invasive vine was found on 498 plots (7.3 percent) and occurred in 16 of the 24 states (Fig. 4). It was not found on plots in Iowa, Maine, Massachusetts, Nebraska, New Hampshire, North Dakota, Rhode Island, and Vermont. These results differ slightly from the PLANTS database (NRCS 2014; Fig. 3); however it is important to remember this inventory only occurs on forest land. Delaware had the highest percentage of plots with Japanese honeysuckle (50.0 percent), closely followed by Maryland (41.0 percent). Additional information about the species monitored and county level occurrence maps for the NRS region from 2005 through 2010 can be found in Kurtz (2013).

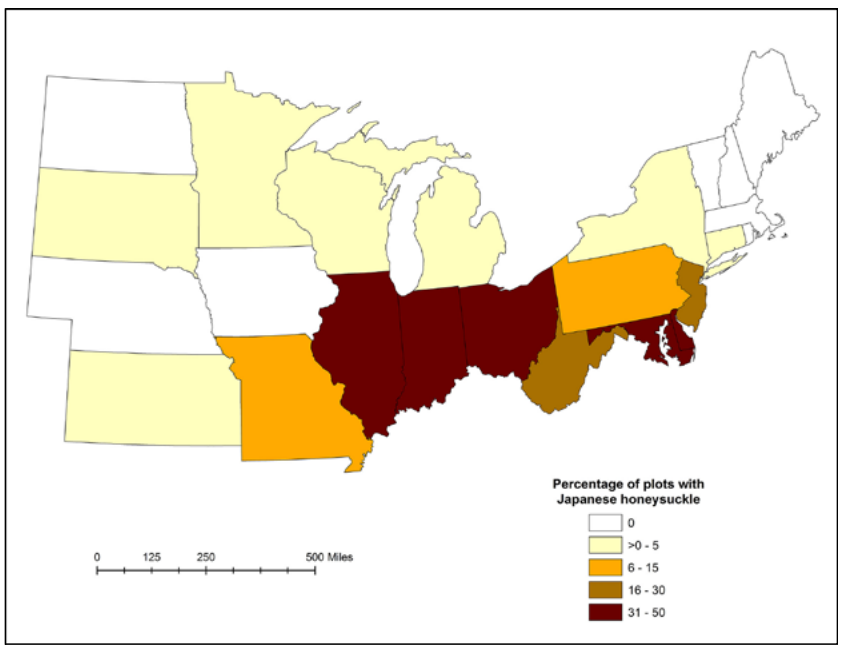

Figure 4.—Inventory reporting area showing percent of Phase 2 Invasive plots with Japanese honeysuckle, 2013.

Japanese honeysuckle. Photo by Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org.

[1] Autumn olive (*Elaeagnus umbellata*), black locust (*Robinia pseudoacacia*), Bohemian knotweed (*Polygonum xbohemicum*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), Chinaberry (*Melia azedarach*), common barberry (*Berberis vulgaris*), common buckthorn (*Rhamnus cathartica*), common reed (*Phragmites australis*), creeping jenny (*Lysimachia nummularia*), dames rocket (*Hesperis matronalis*), English ivy (*Hedera helix*), European cranberrybush (*Viburnum opulus*), European privet (*Ligustrum vulgare*), European swallow-wort (*Cynanchum rossicum*), garlic mustard (*Alliaria petiolata*), giant knotweed (*Polygonum sachalinense*), glossy buckthorn (*Frangula alnus*), Japanese barberry (*Berberis thunbergii*), Japanese honeysuckle (*Lonicera japonica*), Japanese knotweed (*Polygonum cuspidatum*), Japanese meadowsweet (*Spiraea japonica*), leafy spurge (*Euphorbia esula*), Louise's swallow-wort (*Cynanchum louiseae*), multiflora rose (*Rosa multiflora*), Nepalese browntop (*Microstegium vimineum*), nonnative bush honeysuckles (*Lonicera* spp.), Norway maple (*Acer platanoides*), Oriental bittersweet (*Celastrus orbiculatus*), princesstree (*Paulownia tomentosa*), punktree (*Melaleuca quinquenervia*), purple loosestrife (*Lythrum salicaria*), reed canarygrass (*Phalaris arundinacea*), Russian olive (*Elaeagnus angustifolia*), saltcedar (*Tamarix ramosissima*), Siberian elm (*Ulmus pumila*), silktree (*Albizia julibrissin*), spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), Chinese tallow (*Triadica sebifera*), tree of heaven (*Ailanthus altissima*).

[2] The 39 IPS and one undifferentiated genus (nonnative bush honeysuckles) are hereafter referred to as "invasive species", "invasive plants", "invasives", or "IPS".

The percentage cover of Japanese honeysuckle is shown in two figures, one that illustrates cover at the state level (Fig. 5) and a second that focuses on the plot level (Fig. 6). It is important to use caution when looking at overall state averages (Fig. 5) as states with small sample sizes are driven by a small number of plots (e.g., Connecticut). For the states with small sample sizes, Figure 6 is more informative since individual plot values can be assessed. Overall, the highest average percentage cover of Japanese honeysuckle on plots was in Illinois (5.0 percent). These maps, along with Figure 4, reveal important information related to the presence and abundance of Japanese honeysuckle in the NRS region. The occurrence of Japanese honeysuckle is greatest in the southern part of this region. Over time these maps will allow us to assess changes in abundance and spread.

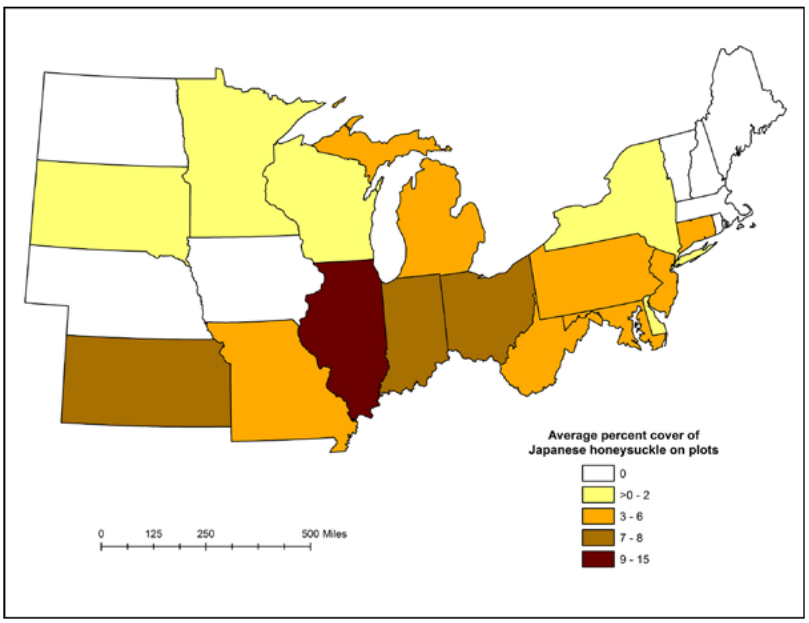

Figure 5.—Average percent cover[3] of Japanese honeysuckle on Phase 2 invasive plots, 2013.

[3] Average percent coverage is based on subplot data and is calculated for the portion of the plot which is forested. Each FIA plot consists of four circular 1/24-acre subplots located at the corners and center of an equilateral triangle that is 208 feet on a side.

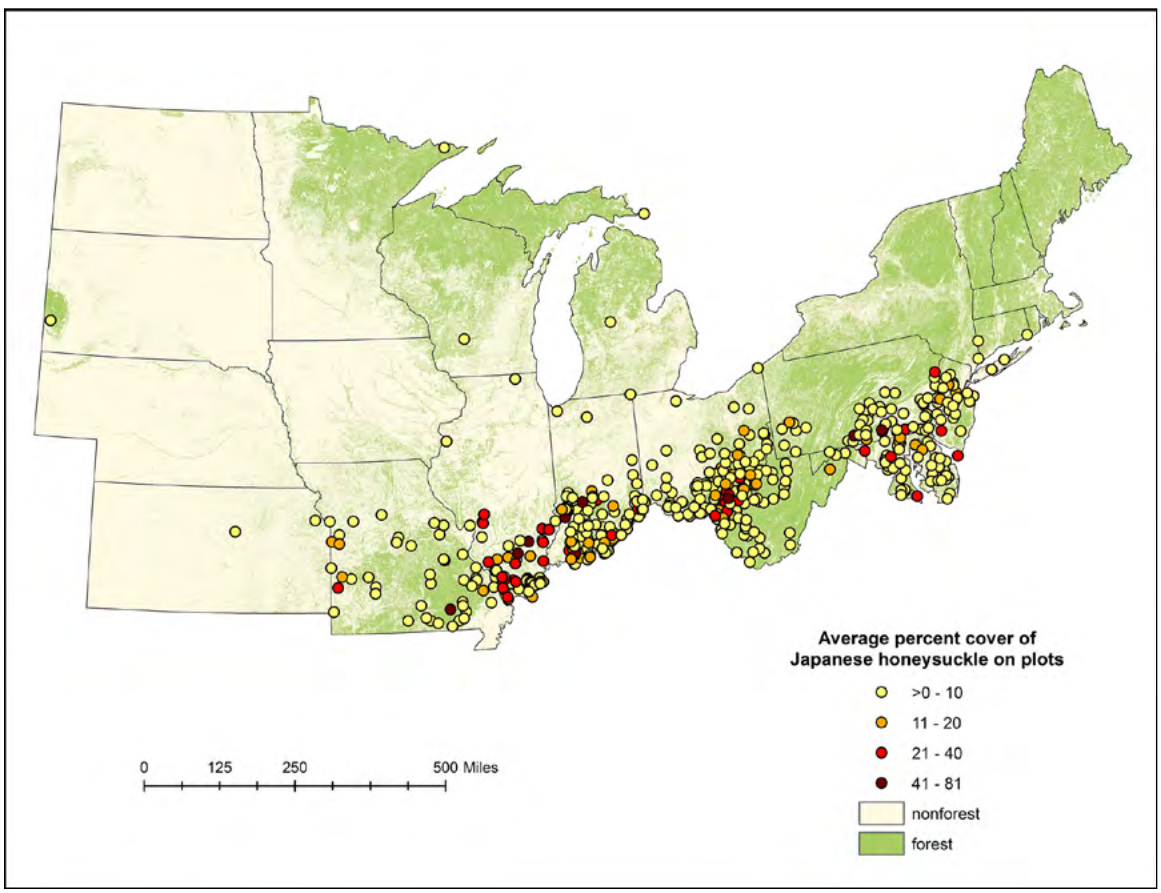

Figure 6.—Average percent cover of Japanese honeysuckle on plots where it occurred, 2013.

Characteristics of Plots with Japanese Honeysuckle

Japanese honeysuckle, a plant often used as an ornamental, was more common on plots near roads. There was a significant difference (t-test; $p<0.05$) in the distance to the nearest road for plots with and without Japanese honeysuckle (Fig. 7). Roads are a conduit for seed dispersal and alter light and nutrient availability, as well as drainage. Vehicles traveling on roads carry propagules of many exotics which become dispersed along them. Roads have been found to be important vectors for IPS (Kurtz and Hansen 2013, Lundgren et al. 2004, Predick and Turner 2008). Due to the effects of roads and other types of fragmentation, it is important to keep forest land intact.

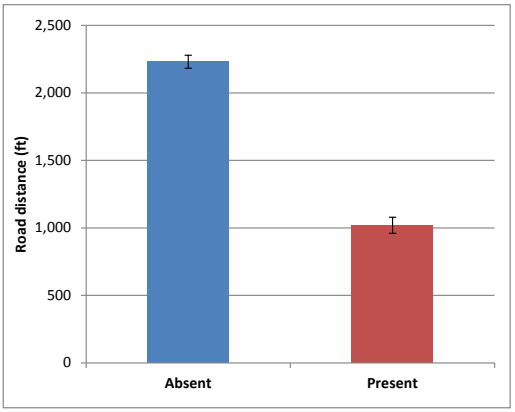

Figure 7.—Average distance to the nearest road for plots with or without japanese honeysuckle, 2013.[4]

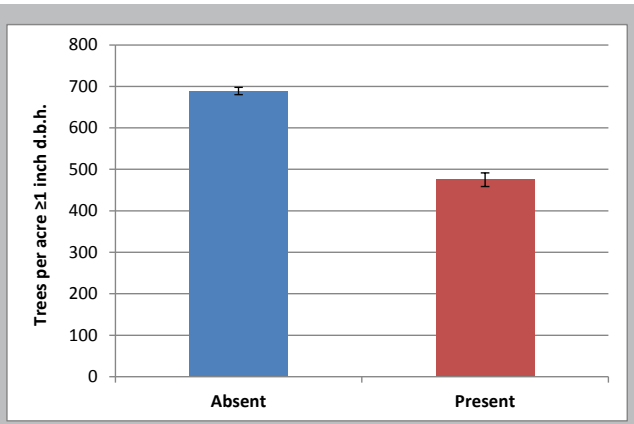

Figure 8.—Trees per acre ≥1 inch d.b.h. with or without Japanese honeysuckle.[4]

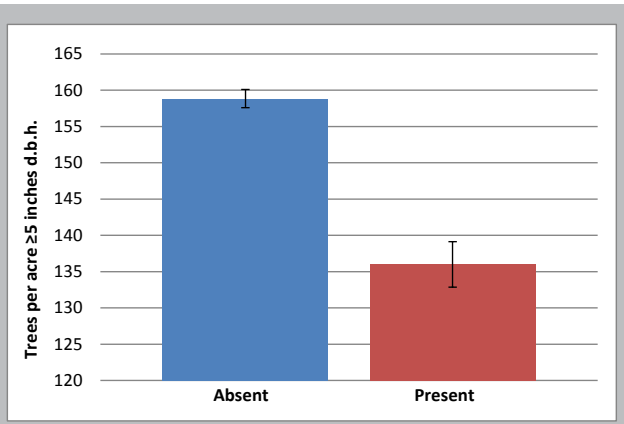

Figure 9.—Trees per acre ≥5 inches d.b.h. with or without Japanese honeysuckle.[4]

Tree cover also differs for plots with and without Japanese honeysuckle. The 2013 data suggest that there are fewer trees per acre (t-test; $p<0.05$) on plots with Japanese honeysuckle (Fig. 8 and 9). Since the study has only been running for a short period of time (complete implementation across all of the NRS region in 2007), it is difficult to assess whether the invasive plants are influencing tree regeneration and growth or if the invasive plants are establishing where there is low tree cover and less competition. Continued investigation into this matter is important because these plants can outcompete native species and without adequate understory regeneration to replace the aging overstory, the future of the forest remains in question. These preliminary investigations are important as they suggest there is a difference between plots with and without Japanese honeysuckle and future studies will help determine the effects these species are causing.

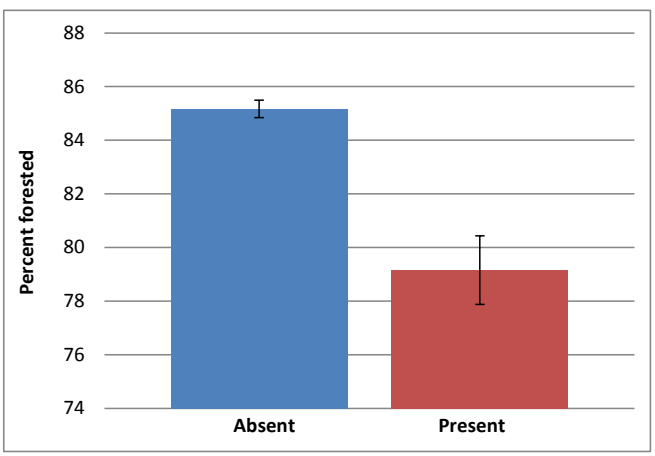

Figure 10.—Percentage of the plot that is forested for plots with or without Japanese honeysuckle.[4]

Further analysis of plots with and without Japanese honeysuckle shows that plots with Japanese honeysuckle tend to be less forested (t-test; $p<0.05$) (Fig. 10). Overall, plots with Japanese honeysuckle are 6 percent less forested (versus plots without Japanese honeysuckle). This suggests Japanese honeysuckle is more frequently found along forest/nonforest edges than in the forest interior.

Monitoring IPS is important to determine status, trends, distribution, and population size, as well as to detect new populations. The trends found in this research note are important and need to be reported in the future to help elucidate important factors related to the presence of these invasives as well as to find out the impacts these species are causing on biota and ecosystems. This research is important as it provides nonbiased data to land managers and other concerned individuals to help make well-informed management decisions.

[4] Note: the error bars in figure 7 through 10 show a 68 percent confidence interval for the observed mean.

Citation for this Publication

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FIA Program Information

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Additional Invasive Plant Information

Alien Plant Invaders of Natural Areas (PCA, National Park Service): http://www.nps.gov/plants/alien/factmain.htm Invasive and Exotic Plants: http://www.invasive.org/species/weeds.cfm

Invasive Plant Atlas of New England: http://www.eddmaps.org/ipane/

Invasive Plant Atlas of the United States: http://www.invasiveplantatlas.org/index.html

Midwest Invasive Plant Network: http://mipn.org/

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