

**An Assessment of Nonnative Bush Honeysuckle in Northern U.S. Forests      Research Note NRS-203**

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**

Nonnative bush honeysuckles (*Lonicera* species) are native to Eurasia and were introduced in the 1700s (Czarapata 2005, Rich 2000). These vigorous, woody shrubs are found throughout the United States and were promoted for ornamental use, wildlife habitat, and erosion control. Due to their widespread planting and vigorous spread, nonnative bush honeysuckles have become problematic in urban areas, abandoned fields, and forest land.

Several characteristics contribute to the proliferation of nonnative bush honeysuckle such as the ability to survive across a wide range of moisture and light regimes, leaf out early, and hold leaves later than most native forest species. In addition, nonnative bush honeysuckle do not require disturbance to establish and they reduce available moisture, light, and nutrients (Czarapata 2005). By reducing the available resources, the plant community can change, which in turn impacts the fauna through altered forage and habitat. An example is noted by Czarapata (2005) and Rich (2000) where several species of birds experience higher nest predation in nonnative bush honeysuckle compared to taller, native species.

**Description**

**Growth:** upright, woody, deciduous perennial shrub to nearly 20 feet. Older shrubs have shaggy bark with stems that are often hollow. Leaves are opposite, simple, and entire.

**Flowers:** tubular, fragrant, red, pink, or white (Fig. 1); late spring.

**Fruit:** abundant yellow, orange, or red berries (Fig. 2), in pairs, beginning when plant is around 3 to 5 years old.

**Reproduction:** abundant fruit, frequently bird dispersed.

**Habitat:** thrives on sunny, upland sites but tolerates a wide variety of habitats including wetlands and forests. Common on forest edges, roadsides, abandoned fields, and homestead sites

**Control:** burning, cutting with herbicide application, and hand pulling (Czarapata 2005, Rich 2000).



**Figure 1.—Nonnative bush honeysuckle in flower.** Photo by Cassandra M. Kurtz, U.S. Forest Service.



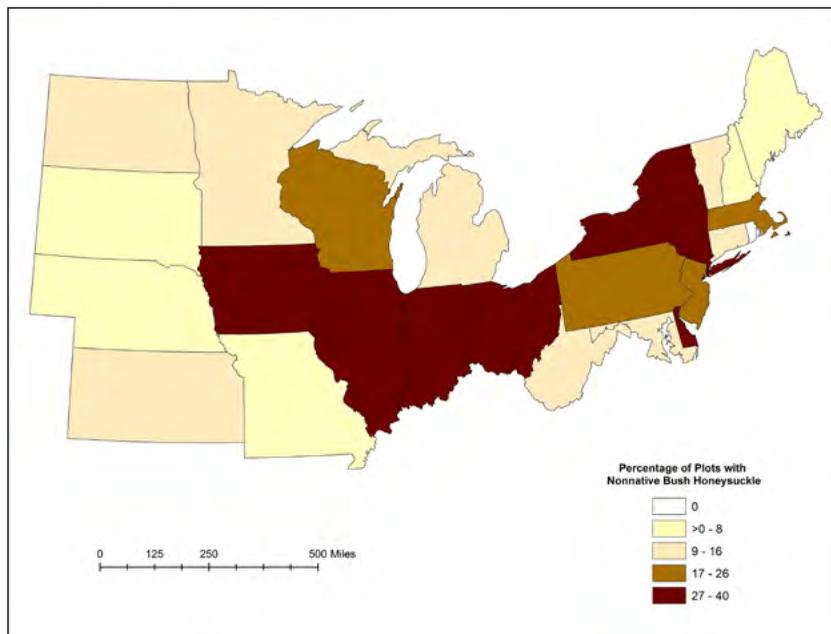
**Figure 2.—Morrow's honeysuckle fruit.** Photo by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

## Nonnative Bush Honeysuckle Presence on Phase 2 Invasive Plots

In addition to the standard Phase 2 (P2) FIA plots, a subset of these plots are designated P2 Invasive where the standard Phase 2 variables (U.S. Forest Service 2014) are collected in addition to data on Invasive plants. The P2 Invasive plots are measured from May 1 through September 30. For the 2009 through 2013 inventory period, field crews visited 6,815 forested P2 Invasive plots. This 5-year cycle (2009 through 2013), 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<sup>1</sup> (IPS) (39 species and one undifferentiated genus [nonnative bush honeysuckles]<sup>2</sup>) were monitored. On each of these plots,<sup>3</sup> 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.

For this report, the species level data for nonnative bush honeysuckle species (Amur, Morrow’s, Tatarian, and showy fly honeysuckle) are compiled and discussed at the genus level. Species level data were combined with the genus level data since differentiation can be difficult and because field crew are not required to identify nonnative bush honeysuckles to the species level. In addition reporting at the genus level offers a broad overview of regional presence. Reporting at the genus level led to 1,204 nonnative bush honeysuckle observations, occurring on 17.7 percent of P2 Invasive plots and makes nonnative bush honeysuckles the second most commonly recorded IPS of the 40 monitored by the NRS. Only multiflora rose was more commonly observed, occurring on 1,890 P2 Invasive plots (27.7 percent) in 2013.

Nonnative bush honeysuckles are present in 23 of the 24 NRS states (Fig. 3), with no observances recorded in Rhode Island. Illinois has the greatest percentage of plots with nonnative bush honeysuckle (39.9 percent). This invasive shrub is also present on over one-third of the plots in Indiana, New York, and Iowa (37.4, 36.8, and 36.5 percent, respectively). 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 3.—Inventory reporting area showing percent of Phase 2 Invasive plots with nonnative bush honeysuckle, 2013.**

<sup>1</sup> 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*), princess tree (*Paulownia tomentosa*), punktree (*Melaleuca quinquenervia*), purple loosestrife (*Lythrum salicaria*), reed canarygrass (*Phalaris arundinacea*), Russian olive (*Elaeagnus angustifolia*), saltcedar (*Tamarix ramosissima*), Siberian elm (*Ulmus pumila*), silk tree (*Albizia julibrissin*), spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), Chinese tallow (*Triadica sebifera*), tree of heaven (*Ailanthus altissima*).

<sup>2</sup> The 39 IPS and one undifferentiated genus (nonnative bush honeysuckles) are hereafter referred to as “invasive species”, “invasive plants”, “invasives”, or “IPS”.

<sup>3</sup> 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.

## Nonnative Bush Honeysuckle Cover on Phase 2 Invasive Plots

Nonnative bush honeysuckle observations are shown in Figure 4 and illustrate the widespread occurrence of this genus. When looking at this figure, it is important to remember that this inventory only occurs in areas that meet FIA's definition of forest land.<sup>4</sup> Together Figures 3 and 4 reveal important information related to the presence and abundance of nonnative bush honeysuckles in the region. Over time, these maps will allow us to assess changes in abundance and spread.

### Further Analysis

When able to identify the species of nonnative bush honeysuckle (Amur, Morrow's, showy fly, or Tatarian honeysuckle), field crew can indicate which species they observe. Showy fly honeysuckle (*Lonicera xbella*), one of the nonnative bush honeysuckles found throughout our region, is a hybrid between Morrow's and Tatarian honeysuckle. Analyzing the species level nonnative bush honeysuckle data shows that Morrow's honeysuckle is the most commonly observed species (Fig. 5) (345 plots; 5.1 percent). Amur honeysuckle is the next most frequently recorded species (261 plots; 3.8 percent), followed by Tatarian (51 plots; 0.7 percent) and showy fly honeysuckle (48 plots; 0.7 percent).

Despite being ecologically similar, these species differ in range. Amur honeysuckle is most problematic in the southern part of this region but is spreading northward (Czarapata 2005). It will be important to continue to monitor the spread and abundance of each of the species of nonnative bush honeysuckle over time as these species are having vast ecological and economic impacts across the landscape.

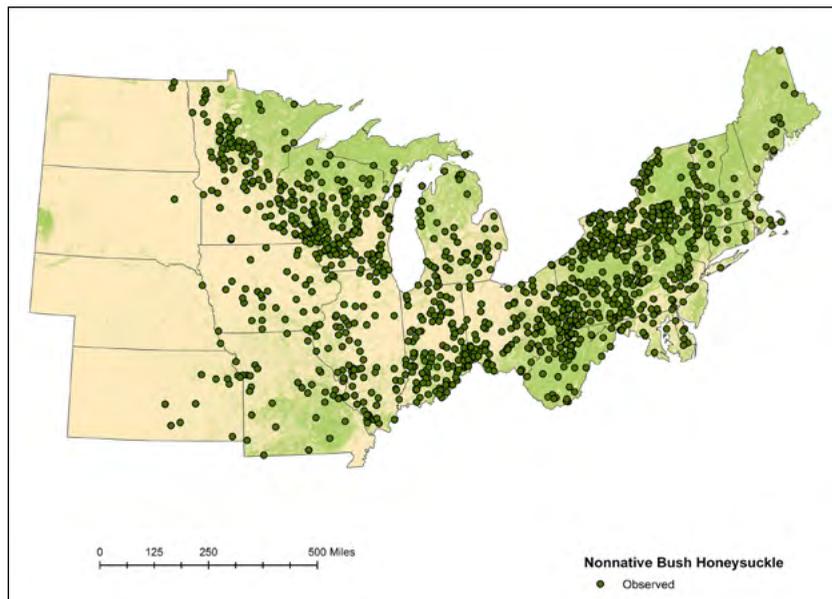


Figure 4.—Nonnative bush honeysuckle observances, 2013.

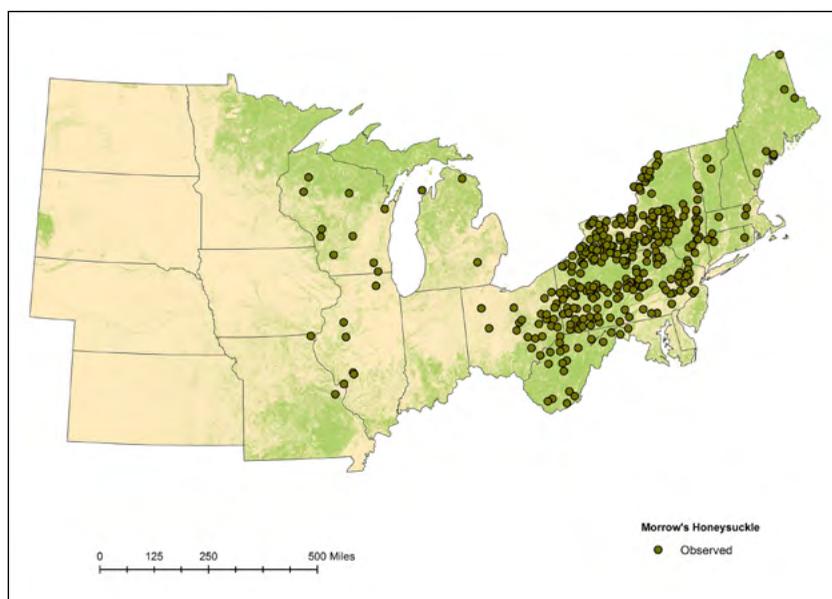


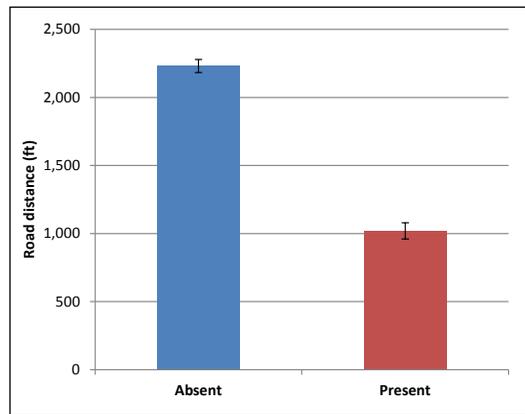
Figure 5.—Morrow's honeysuckle observances, 2013.

<sup>4</sup>In general, area must be at least 10 percent stocked with trees of any size or formerly having such tree cover and not currently developed for nonforest use with a minimum classification area of 1 acre and 120 feet in width.

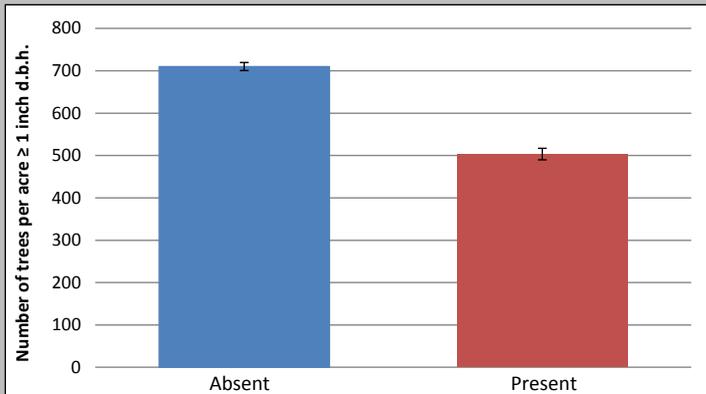
# Characteristics of Plots with Nonnative Bush Honeysuckle

Nonnative bush honeysuckle, a shrub 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 nonnative bush honeysuckle (Fig. 6). These findings emphasize the importance of intact forest land.

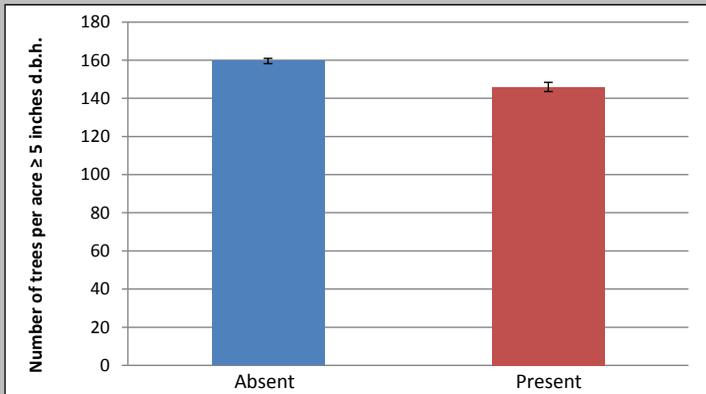
Roads act as a conduit for seed dispersal and alter light and nutrient availability, as well as drainage. Vehicles traveling on roads can carry propagules of many exotics which become dispersed along them. Roads have been found to be important vectors for IPS (Kurtz and Hansen 2013, Lundgren et al. 2004, Predick and Turner 2008).



**Figure 6.—Average distance to the nearest road for plots with or without nonnative bush honeysuckle, 2013.**

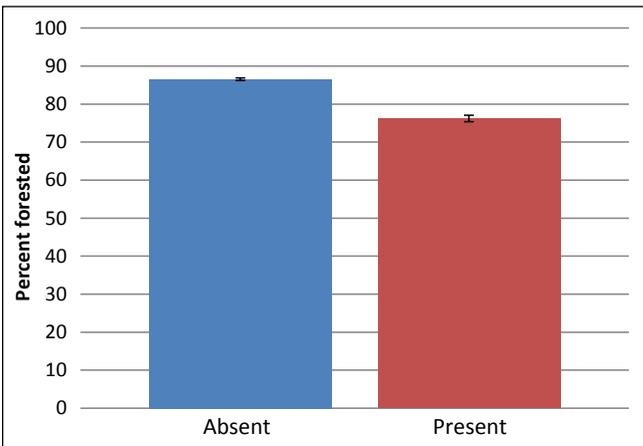


**Figure 7.—Trees per acre ≥ 1 inch d.b.h. with or without nonnative bush honeysuckle, 2013.**



**Figure 8.—Trees per acre ≥ 5 inches d.b.h. with or without nonnative bush honeysuckle, 2013.**

Tree cover also differs for plots with and without nonnative bush honeysuckle. The 2013 data suggest that there are fewer trees per acre on plots with nonnative bush honeysuckle (t-test;  $p < 0.05$ ) (Figs. 7 and 8). Since the study has only been running for a short period of time (complete implementation across the 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 monitoring 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 results are important as they suggest there is a difference between plots with and without nonnative bush honeysuckle and future studies will help determine the effects these species are causing.



**Figure 9.—Percentage of the plot that is forested for plots with or without nonnative bush honeysuckle, 2013.**

Further analysis of plots with and without nonnative bush honeysuckle shows that plots with nonnative bush honeysuckle tend to be less forested (t-test;  $p < 0.05$ ) (Fig. 9). Overall, plots with nonnative bush honeysuckle are 6 percent less forested than plots without nonnative bush honeysuckle. This indicates nonnative bush honeysuckle occurs more frequently 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 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 provides non-biased data to land managers and other concerned individuals to help with management decisions.

\* Note: the error bars in figure 6 through 9 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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Kurtz, C.M. 2013. **An assessment of invasive plant species monitored by the Northern Research Station Forest Inventory and Analysis Program, 2005 through 2010.** Gen. Tech. Rep. NRS-109. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 70 p.

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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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