

Invasive Plants Found in Virginia Forests, 2010

Introduction

This publication provides an overview of invasive plants found in forests of the State of Virginia based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) Program at the Southern Research Station (SRS) of the Forest Service, U.S. Department of Agriculture in cooperation with the Virginia Department of Forestry. These estimates and coverage maps will be updated on a periodic basis. For more information regarding past inventory reports for this State, inventory program information, field sampling methodology, and estimation procedures, please refer to the citations at the end of this report.

Foresters and ecologists have noted the spread of invasive plant species onto U.S. forest land for decades. Despite soaring costs and inestimable environmental impacts, invasive species continue to spread across managed and natural forests. This update describes current results from data collected in Virginia between 2006 and 2010 and provides graphic illustrations of where invasive plants are

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being observed in forests across the State of Virginia. Observations of invasive plants include only those plants on the SRS FIA invasive plants "watch list" which currently contains 33 plant species regionally recognized as problematic invasive plants.

Findings

Invasive plants were detected on 1,801 plots across the State, or 60 percent of all forested plots measured (fig. 1). The maximum number of invasive plant species detected on an individual plot was seven, which occurred on <1 percent of forested plots (table 1). Approximately 50 percent of invaded plots contained only one invasive plant from the SRS FIA watch list, while 76 percent of invaded plots contained only one or two invasive plants (table 1). Forests in the Southern and Northern Piedmont units exhibited the highest frequency of invasion with 73 and 71 percent

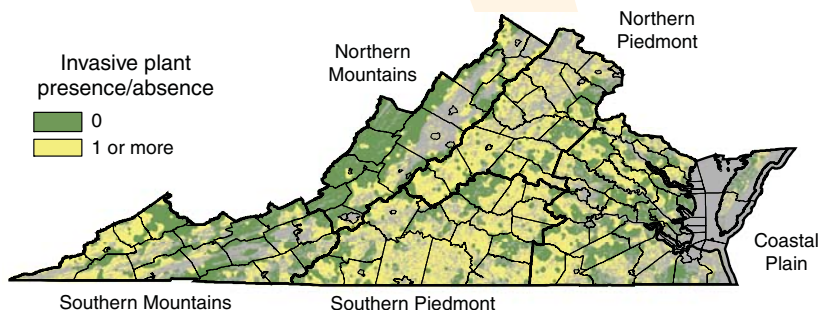


Figure 1—Presence/absence of invasive species on Virginia forest land, statewide 2010.

Table 1—Number of invasive species detected on forest land by survey unit and percent of plots on which they occur, Virginia, 2010

Number of unique species detected ^a	Survey unit					Total of invaded plots	Invaded plots ^b
	Coastal Plain	Southern Piedmont	Northern Piedmont	Northern Mountains	Southern Mountains		
	number of plots						percent
1	289	281	134	63	132	899	30
2	126	141	97	48	66	478	16
3	41	68	62	38	48	257	8
4	13	25	37	14	26	115	4
5	2	8	10	7	10	37	1
6	—	2	6	2	3	13	<1
7	—	2	—	—	—	2	<1
Total invaded plots (all species)	471	527	346	172	285	1,801	—
Percent of all sampled plots	64	73	71	35	49	60	—
Total number of sampled plots	735	725	487	493	584	3,024	—

^aUp to 4 unique species may be noted per subplot, for a total possibility of 16 unique species per complete plot.

^bPercent of survey plots (out of 3,024) with the listed number of unique species.

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Japanese honeysuckle. (photo courtesy of James H. Miller, USDA Forest Service, Bugwood.org)



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of sampled plots containing at least one invasive plant, respectively. Forested plots in the Northern Mountains unit were less likely to contain invasive plants with only 35 percent of plots containing at least one invasive plant.

The distribution of invasive plants in the Southern and Northern Piedmont units is considerably higher than both the Southern and Northern Mountain units (fig. 1). While Japanese honeysuckle (*Lonicera japonica*) plays a large role in the regional (unit) differences, many of the invasive plants monitored by FIA exhibit a similar pattern. These differences may be due to land use, differences in overall species richness, site productivity, length of growing season, forest type characteristics, or other environmental differences (e.g., soil, moisture, temperature, precipitation, elevation, aspect).

Japanese honeysuckle was the most frequently detected nonnative species in Virginia (table 2). The seemingly ubiquitous invasive vine was found on 45 percent of all forested plots surveyed, and 75 percent of all plots containing an invasive species. On average, Japanese honeysuckle foliage covered 15 percent of the subplots on which it was found. Nonnative roses (*Rosa* spp.), as a group, was the second most frequently detected species, and was noted on 18 percent of measured plots, with an average percent cover of approximately 8 percent on subplots where it was detected. Tree-of-heaven (*Ailanthus altissima*) was the third most frequently observed invasive plant, and Nepalese browntop (*Microstegium vimineum*) was the fourth most frequently observed invasive plants in forests of Virginia. Chinese and European privets (*Ligustrum sinense*/L. *vulgare*), as a group, was the fifth most frequently detected species, and was noted on only 6 percent of measured plots, with an average percent cover of approximately 7 percent on subplots where it was detected. The above mentioned species along with autumn olive (*Alaegagnus umbellata*), tall fescue (*Lolium arundinaceum*), Chinese lespedeza (*Lepedeza*

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cuneata), shrubby lespedeza (*Lepedeza bicolor*), and Paulownia (*Paulownia tomentosa*) comprise the top 10 most frequently detected invasive plants surveyed for on forested plots in Virginia (table 2).

Invasive vines, primarily Japanese honeysuckle, were the most frequently detected invasive plant life form (table 3) and were found on 48 percent of all forested plots. Invasive shrubs were found on 31 percent of all forested plots, while trees were found on 14 percent, grasses on 11 percent, and forbs were found on only 7 percent of all forested plots.

Invasive trees were noted throughout the State (fig. 2). Tree-of-heaven was the most frequently detected invasive tree across the State and found on a significantly higher number of plots than any other invasive tree monitored [tree-of-heaven found on 334 plots, Paulownia found on 70 plots, mimosa (*Albizia julibrissin*) found on 14 plots, and Russian olive (*Elaeagnus angustifolia*) found on 1 plot]. Japanese honeysuckle was the most commonly detected vine (fig. 3) and was recorded on 57, 64, 59, 17, and 17 percent of forested plots in the Coastal Plain, Southern Piedmont, Northern Piedmont, Northern Mountains, and Southern Mountains, respectively. Observations of Japanese honeysuckle were considerably lower in the mountains of Virginia. No other invasive vine was detected on >2 percent of plots in any region. Nonnative roses were clearly the most frequently detected shrubs (fig. 4) on Virginia forest land and were detected on 18 percent of all forested plots across the State. Chinese and European privets occupied more plots in each region than any other invasive shrub on the watch list. Chinese and European privets, as a group, were observed on 6 percent of forested plots in the Piedmont and represented the only other significant observation of invasive shrubs in the State.

Table 2—Invasive species detected on forest land by common name, scientific name, frequency of plot detections, and mean percent subplot cover, Virginia, 2010

Common name	Scientific name	Plot detections number	Mean percent subplot cover percent
Japanese honeysuckle	<i>Lonicera japonica</i>	1,355	15
Nonnative roses	<i>Rosa</i> spp.	548	8
Tree of Heaven	<i>Ailanthus altissima</i>	334	10
Nepalese browntop	<i>Microstegium vimineum</i>	212	16
Chinese/European privet	<i>Ligustrum sinense</i> /L. <i>vulgare</i>	180	7
Autumn olive	<i>Elaeagnus umbellata</i>	125	9
Tall fescue	<i>Lolium arundinaceum</i>	112	19
Chinese lespedeza	<i>Lepedeza cuneata</i>	94	9
Shrubby lespedeza	<i>Lepedeza bicolor</i>	84	8
Princesstree, Royal paulownia	<i>Paulownia tomentosa</i>	70	4
Bush honeysuckles	<i>Lonicera</i> spp.	66	7
Garlic mustard	<i>Alliaria petiolata</i>	40	9
Oriental bittersweet	<i>Celastrus orbiculatus</i>	30	11
Wintercreeper	<i>Euonymus fortunei</i>	22	11
Silktree, Mimosa	<i>Albizia julibrissin</i>	14	5
English ivy	<i>Hedera helix</i>	13	17
Nonnative vincas, Periwinkles	<i>Vinca minor</i> /V. <i>major</i>	13	26
Japanese/glossy privet	<i>Ligustrum japonicum</i> /L. <i>lucidum</i>	12	12
Winged burning bush	<i>Euonymus alata</i>	11	4
Kudzu	<i>Pueraria Montana</i> var. <i>lobata</i>	9	7
Chinese/Japanese wisteria	<i>Wisteria sinensis</i> /W. <i>floribunda</i>	8	18
Chinese silvergrass	<i>Miscanthus sinensis</i>	4	15
Nonnative bamboos	<i>Phyllostachys</i> spp., <i>Bambus</i> spp.	3	22
Nandina	<i>Nandina domestica</i>	2	6
Russian olive	<i>Elaeagnus angustifolia</i>	1	<1
Nonnative climbing yams-air yam/Chinese yam	<i>Dioscorea bulbifera</i> /D. <i>oppositifolia</i>	1	4

Table 3—Invasive species detected on forest land by life form and survey unit, Virginia, 2010

Life form	Survey unit					Total
	Coastal Plain	Southern Piedmont	Northern Piedmont	Northern Mountains	Southern Mountains	
	number					
Trees	55	114	128	63	59	419
Shrubs	122	228	169	135	290	944
Vines	446	487	312	90	116	1,451
Grasses	39	52	95	58	87	331
Forbs	64	52	44	30	28	218

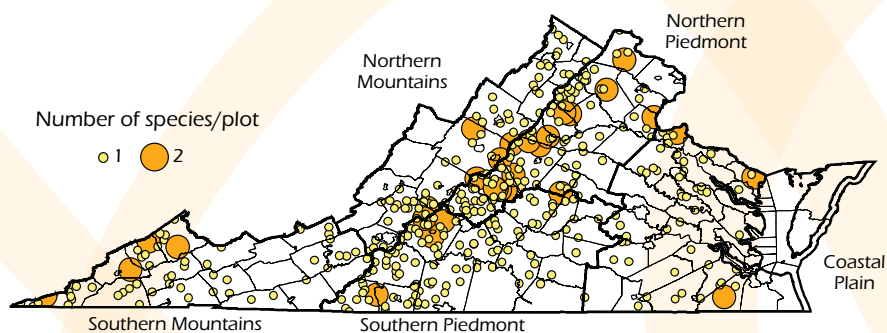


Figure 2—Number of invasive trees on plots, Virginia 2010.

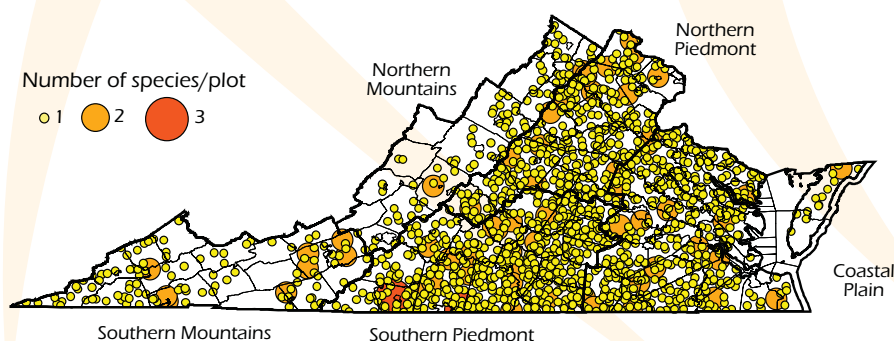


Figure 3—Number of invasive vines on plots, Virginia 2010.

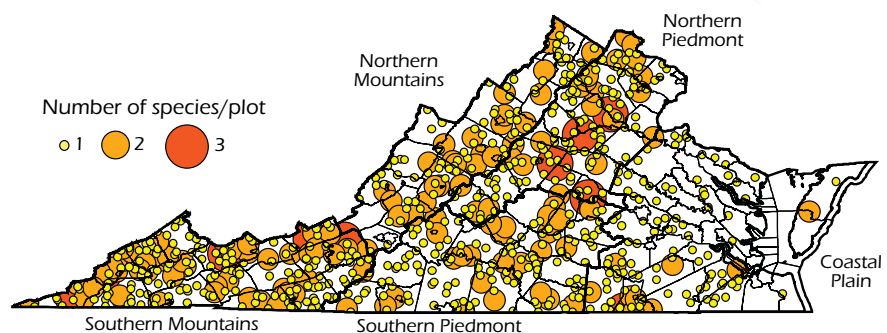


Figure 4—Number of invasive shrubs on plots, Virginia 2010.

While invasive grasses were not observed on forest lands within the State with the same frequency as other life forms, Nepalese browntop was observed in each unit of the State with enough frequency to warrant attention. Nepalese browntop was most frequently noted in the Northern Piedmont unit being found on 14 percent of forested plots within the unit.

Conclusions

Invasive species are common on forested plots across the State of Virginia. The prevalence of invasive plants on Virginia forest land illustrates the need for public education regarding their ecological and economic costs, and the need for concentrated control and management efforts to lessen their impact on forested systems.

FIA Program Information

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Additional Virginia Information

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Russian olive. (photo courtesy Patrick Breen,
Oregon State University, Bugwood.org)

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