Invasive Plants Found in South Carolina Forests, 2010

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FOREST INVENTORY & ANALYSIS FACTSHEET

Introduction

This publication provides an overview of nonnative invasive plants found in forests of the State of South Carolina based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) Program at the Southern Research Station (SRS) of the U.S. Department of Agriculture Forest Service in cooperation with the South Carolina Forestry Commission. 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 nonnative invasive species onto U.S. forest land for decades. Despite soaring costs of control efforts and inestimable environmental impacts, nonnative invasive species continue to spread across managed and natural forests. This update describes current results from data collected in South Carolina between 2006 and 2010 and provides graphic illustrations of where invasive plants are being observed in forests across the State of South Carolina. Observations of nonnative invasive plants include only those plants on the Southern FIA invasive plants "watch list" which currently contains 33 plant species regionally recognized as problematic nonnative invasive plants.

Glossy privet. (photo by James H. Miller)

Findings

Invasive plants were detected on 1,386 plots across the State, or 55 percent of all forested plots measured (table 1). The maximum number of nonnative invasive species detected on an individual plot was eight, but this number occurred on <1 percent of forested plots (table 1). About 42 percent of invaded plots contained only one invasive plant from the SRS-FIA watch list, while 93 percent of the invaded plots contained only one or two invasive plants (table 1). Forests in the Piedmont exhibited the highest frequency of invasion with 84 percent of sampled plots containing at least one invasive plant. The Southern and Northern Coastal Plain units had a similar invasion frequency of 38 and 41 percent, respectively.

Table 1—Number of invasive species detected on forest land by survey unit and percent of plots on which they occur, South Carolina, 2009

Number of unique species detected[a]	Survey unit: Southern Coastal Plain	Northern Coastal Plain	Piedmont	Total	Invaded plots[b]
	number of plots				*percent*
1	160	188	208	556	22
2	66	141	288	495	20
3	24	39	171	234	9
4	3	11	50	64	3
5	2	5	22	29	1
6	—	—	5	5	<1
7	—	1	1	2	<1
8	—	—	1	1	<1
Total invaded plots (all species)	255	385	746	1,386	—
Percent of all sampled plots	38	41	84	55	—
Total number of sampled plots	675	933	892	2,500	—

— = no sample for the cell.

[a] Up to 4 unique species may be noted per subplot, for a total possibility of 16 unique species per complete plot.

[b] Percent of survey plots with the listed number of unique species, out of 2,500.

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The occurrence of nonnative invasive plants in the Piedmont unit is considerably higher than both the Southern and Northern Coastal Plain units (fig. 1). While Japanese honeysuckle (*Lonicera japonica*), extremely common on forest land throughout the South, can be viewed as the driver of this dichotomy, many of the invasive plants monitored by FIA exhibit a similar pattern. The Piedmont unit is particularly susceptible to colonization by nonnative species (Oswalt 2006). 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 (soil, moisture, temperature, precipitation, elevation, aspect). For example, the predominately deciduous forest of the Piedmont unit may be more susceptible to invasion by semievergreen and evergreen nonnative species than the evergreen pine forests of the Coastal Plain unit.

Japanese honeysuckle was the most frequently detected nonnative species in South Carolina (table 2).

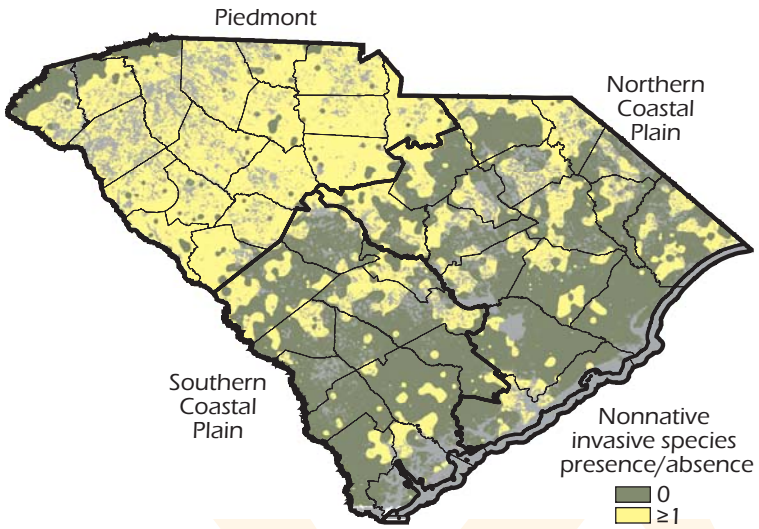

Figure 1—Presence/absence of nonnative invasive species on forest land, South Carolina, 2009.

Table 2—Nonnative Invasive species detected on forest land by common name, scientific name, frequency of plot detections, and mean percent subplot cover, South Carolina, 2009

Common name	Scientific name	Plot detections	Mean percent subplot cover
		number	*percent*
Japanese honeysuckle	*Lonicera japonica*	1,149	17
Chinese/European privet	*Ligustrum sinense/L. vulgare*	603	14
Chinese lespedeza	*Lespedeza cuneata*	305	10
Shrubby lespedeza	*Lespedeza bicolor*	110	7
Nonnative roses	*Rosa* spp.	73	8
Nepalese browntop	*Microstegium vimineum*	65	28
Silverthorn	*Elaeagnus pungens*	61	10
Tallowtree	*Triadica sebifera, Sapium sebiferum*	50	9
Chinaberry	*Melia azedarach*	50	10
Silktree, Mimosa	*Albizia julibrissin*	47	8
Chinese/Japanese wisteria	*Wisteria sinensis/W. floribunda*	36	24
Tree-of-heaven	*Ailanthus altissima*	25	17
Kudzu	*Pueraria Montana* var. *lobata*	22	37
Japanese/glossy privet	*Ligustrum japonicum/L. lucidum*	21	11
Autumn olive	*Elaeagnus umbellate*	20	6
Nandina	*Nandina domestica*	16	5
English ivy	*Hedera helix*	9	49
Nonnative climbing yams-air yam/Chinese yam	*Dioscorea bulbifera/D. oppositifolia*	7	11
Princesstree, Royal paulownia	*Paulownia tomentosa*	7	5
Tropical soda apple	*Solanum viarum*	5	17
Tall fescue	*Lolium arundinaceum*	5	39
Nonnative vincas, Periwinkles	*Vinca minor/V. major*	5	10
Nonnative bamboos	*Phyllostachys* spp., *Bambus* spp.	4	20
Japanese climbing fern	*Lygodium japonicum*	2	9
Bush honeysuckles	*Lonicera* spp.	2	18
Oriental bittersweet	*Celastrus orbiculatus*	1	<1
Winged burning bush	*Euonymus alata*	1	30

The seemingly ubiquitous invasive vine was found on 46 percent of all forested plots surveyed, and 83 percent of all plots containing an invasive species. On average, Japanese honeysuckle foliage covered 17 percent of the subplots on which it was found. Chinese and European privet (*Ligustrum sinense/L. vulgare*), as a group, was the second most frequently detected species, and was noted on 24 percent of measured plots, with an average percent cover of about 14 percent on subplots where it was detected. Chinese lespedeza (*Lespedeza cuneata*) was the third most frequently observed nonnative invasive in forests of South Carolina. Shrubby lespedeza (*L. bicolor*) was the fourth most frequently detected species, and was noted on only 4 percent of measured plots, with an average percent cover of about 7 percent on subplots where it was detected. The above mentioned species along with nonnative roses (*Rosa* spp.), Nepalese browntop (*Microstegium vimineum*), silverthorn (*Elaeagnus pungens*), tallowtree (*Triadica sebifera, Sapium sebiferum*), Chinaberry (*Melia azedarach*), and mimosa (*Albizia julibrissin*) comprise the top 10 most frequently detected "watch list" invasive plants on forested plots in South Carolina (table 2).

Invasive vines, primarily Japanese honeysuckle, was the most frequently detected nonnative invasive plant life-form (table 3) and was found on 49 percent of all forested plots. Invasive shrubs were found on 32 percent of all forested plots,

Table 3—Nonnative invasive species detected on forest land by life form and survey unit, South Carolina, 2009

	Survey unit			
Life form	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Total
		number		
Trees	57	53	69	179
Shrubs	91	209	497	797
Vines	171	333	725	1,229
Grasses	—	7	67	74
Forbs	67	61	294	422

— = no sample for the cell.

Japanese honeysuckle. (photo by Chuck Bargeron, Bugwood.org)

while forbs were found on 17 percent, trees on 7 percent, and grasses were found on only 3 percent of all forested plots.

Invasive trees were noted throughout the State (fig. 2). Chinaberry and tallowtree were the most frequently detected invasive trees across the State. Tallowtree was the most frequently detected invasive tree in the Southern Coastal Plain unit while Chinaberry was more frequent in the Northern Coastal Plain unit and mimosa was more frequent in the Piedmont unit. Japanese honeysuckle was the most commonly detected vine and was recorded on 23 percent of plots in the Southern Coastal Plain unit, 33 percent of plots in the Northern Coastal Plain unit, and 78 percent of plots in the Piedmont unit (fig. 3). No other invasive vine was detected on >3 percent of plots in any region. Chinese and European privet were clearly the most frequently detected shrubs on South Carolina forest land and were detected on 24 percent of all forested plots across the State. Chinese and European privet occupied more plots in each region than any other invasive shrub on the watch list (fig. 4). Nonnative roses were observed on 7 percent of forested plots in the Piedmont unit and represented the only other significant observation of nonnative invasive shrubs in the State. Invasive grasses were rarely observed on forest lands within the Coastal Plain unit. In the Piedmont unit, Nepalese browntop was the most abundant invasive grass, but only occurred on <1 percent of the FIA plots.

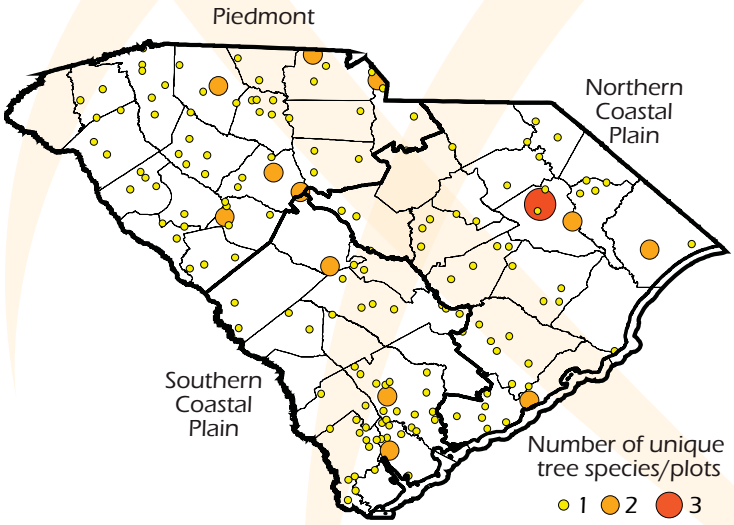

Figure 2—Number of invasive trees on plots, South Carolina, 2009.

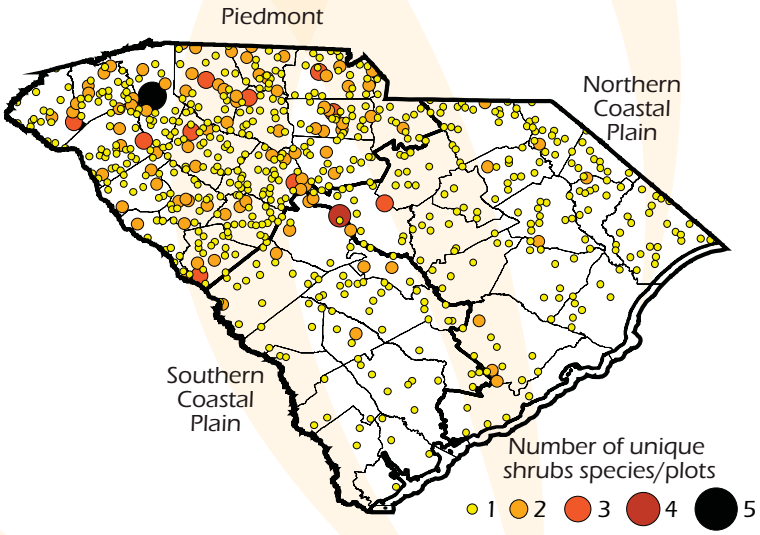

Figure 4—Number of invasive shrubs on plots, South Carolina, 2009.

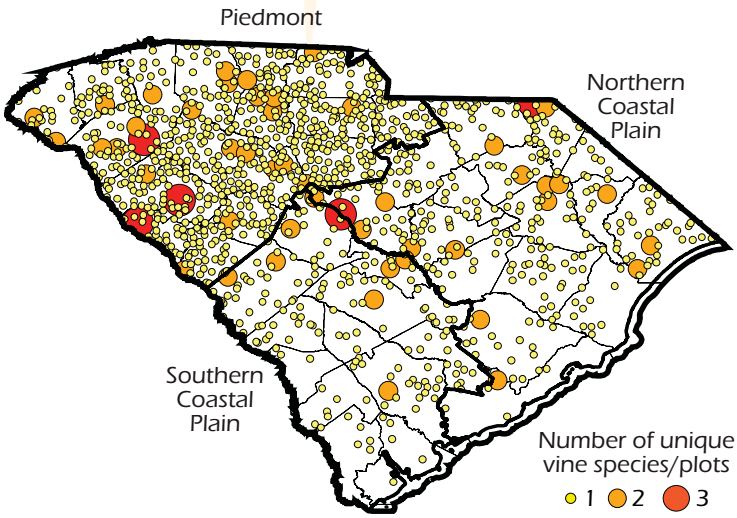

Figure 3—Number of invasive vines on plots, South Carolina 2009.

Conclusions

Invasive species are common on forested plots across the State of South Carolina. The prevalence and associated impacts of invasive plants on South Carolina forest land illustrates the need for public education regarding the ecological and economic costs of invasive plants, and the need for concentrated control and management efforts for invasive plants.

FIA Program Information

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Mimosa. (photo by James H. Miller)

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