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The Siege of Weeds: Monitoring Exotic Invasive Plant Pests in Southern Forests

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Abstract

Exotic invasive plant species monitoring helps assess their extent and rate of invasion. Long term, the purpose is to predict—with associated landscape and forest stand attributes—the regional risk of invasion, persistence, and economic impact to forest resources and the management of natural areas. Integrated pest management programs need such information to justify social, biological, and economic strategies that mitigate these risks.

FIA and cooperators developed three successively adaptive efforts to assess exotic invasives in Southern forests. The first effort began in the early 1980s in the Southeast with dominant understory species cover on 0.09-acre interior forest plots—and the second across the South with a prism tally of selected exotic tree species. In 2001, monitoring by cover class began for a suite of widely recognized nonindigenous species known to invade forest edge, gap, or interior habitats.

From the understory species inventory effort, analysis of some 29,000 forested sample plots in five Southeast States indicated that Privet (*Ligustrum* spp.) was an increasing threat. Occurrence nearly doubled to 4.0 million acres (5% of timberland) between the 1980s and 1990s, principally on the Southern Coastal Plain. Tests indicated no statistically significant area change ($P(X^2)<0.05$) in six other species—Kudzu (*Pueraria montana*), Japanese honeysuckle (*Lonicera japonica*), Melaleuca, Multiflora rose (*Rosa* spp.), Tree-of-heaven (*Ailanthus* spp.), and Royal Paulownia (*Paulownia tomentosa*). Surveys in the 1990s noted that Japanese honeysuckle occurred on 15 million acres (20% of timberland), Multiflora rose—0.9%. Tree-of-Heaven—0.6%, Melaleuca—0.5%, Kudzu—0.2%, and Paulownia—0.1%. Melaleuca, restricted chiefly to the extreme south, occurred on 13.2% of south Florida's 1995 timberland survey. Distribution of Chinese tallow (*Triadica sebifera*) from Louisiana 1991, east Texas 1992,

Mississippi 1994, and Alabama 2000 tree tallies showed larger ($\geq$5 in dbh) trees presently restricted to the Gulf Coast south of 32 degrees latitude.

The third effort, now in use, inventories 32 widely-recognized exotic invasive plant taxa. Training assistance and a color-enhanced training manual is designed for year-round identification on forest subplots with five cover categories: <1, 1-10, 11-50, $>50\%$, and “present in the vicinity but not on the subplot.” Formal sampling began in six States in 2001 with plans to expand throughout the South.

In addition to above species, additional trees include chinaberry, mimosa, and Russian olive; shrubs include autumn olive, bush honeysuckle, winged burning bush, nandina, and silverthorn; vines include oriental bittersweet, wintercreeper, wisterias, Japanese climbing fern, vincas, and exotic climbing yams. Grasses include cogongrass, miscanthus, microstegium, giant reed, tall fescue, and exotic bamboos. Forbs and subshrubs are garlic mustard, Chinese and shrubby lespedeza, and tropical soda apple. In Florida, State crews are monitoring 30 additional tropical and subtropical species. Relevant web sites are http://www.srs.fs.fed.us/fia/manual/sections/Section_4.0.pdf, and http://www.srs.fs.fed.us/fia/manual/exotic_pest_plants.htm