UPDATING THE SOUTHERN NONNATIVE PLANT WATCH LIST: THE FUTURE OF NNIP MONITORING IN THE SOUTH

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Abstract.—The Southern Research Station (SRS) Forest Inventory and Analysis (FIA) Program began monitoring nonnative invasive plant (NNIP) species in 2001 in response to a growing desire to track potential forest health threats on United States forest land. The SRS-FIA NNIP program has produced significant results and contributed considerably to the understanding of the distribution and spread of NNIP in the southern United States. However, opportunities to improve NNIP monitoring in the South do exist. Specifically, the SRS-FIA program monitors only a select number of NNIP species. Given the importance of monitoring nonnative invasive plants in southern forests coupled with the emergence of newly detected plant invaders, the emergence of previously known invasive plants as problematic species, and incomplete knowledge of accurately predicting exotic invasives, the select list of NNIP required updating. The SRS-FIA watch list was thoroughly reviewed with respect to potential removal of some species from the list of monitored plants. For example, a recent analysis found that out of over 33,000 subplots, some plant species were detected on 3 or fewer subplots. While such small detection rates do not indicate a lack of needed monitoring, with limited resources, the SRS-FIA program must review the importance of monitoring such species in the future. The watch list must also reflect current knowledge and account for newly discovered important southern forest invaders. Both scientists and land managers have identified numerous regionally and nationally important nonnative invasive plant species not currently on the SRS-FIA watch list. A group of regional and national NNIP experts (internal and external to FIA) were assembled with the task of evaluating and updating the SRS-FIA watch list. The proposed new watch list for SRS-FIA is presented.

INTRODUCTION

Given the importance of monitoring nonnative invasive plants (NNIP) in southern forests coupled with the emergence of newly detected plant invaders, the emergence of previously known invasive plants as problematic species, and incomplete knowledge of accurately predicting exotic invasives, the Southern Research Station (SRS) Forest Inventory and Analysis (FIA) Program must periodically evaluate the select list of nonnative invasive plants that are monitored by the program. The SRS-FIA watch list should be thoroughly reviewed with respect to potential removal of some species from the list of monitored plants. For example, Oswalt and Oswalt (2011) found that out of over 33,000 subplots, some plant species were detected on 3 or fewer subplots. While such small detection rates do not indicate a lack of needed monitoring, with limited funding and limited time for adequately training personnel on the identification of species, the SRS-FIA program must review the importance of monitoring such species in the future. The watch list must also reflect current knowledge and account for newly discovered important southern forest invaders. Miller et al. (2010) identified numerous regionally and nationally important nonnative invasive plant species not currently on the SRS-FIA watch list. The SRS-FIA

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watch list has been stable for approximately 10 years (2001-2011). A review of the watch list at this time was considered necessary.

METHODS

A three-step approach was defined prior to the formal evaluation by a team of national and regional experts including Christopher M. Oswalt (Lead, SRS-FIA), Sonja N. Oswalt (SRS-FIA), Zimmerman (SRS-FIA), Jim Miller (SRS, Auburn, AL), Nancy Fraley (National Park Service, Ashville, NC), Chris Brown (Texas Forest Service, College Station, TX), David Dickinson (Georgia Forestry Commission, Carrolton, GA), Jay Frost (SRS-FIA), and Rebekah Wallace (University of Georgia, Tifton, GA). First, a list of species for potential removal from the watch list was developed through a quantitative assessment of occurrence. Next, through a comprehensive assessment of potential species, the team developed a list of candidate species for addition to the watch list. A final proposed watch list was then developed by the team for submission to the U.S. Forest Service Regional Management Team with SRS-FIA programmatic oversight.

In an attempt to address the potential removal of plant species from the watch list, all available data (2001 through 2010 for most southern states) were assembled from the Southern Nonnative Invasive Plant data Extraction Tool (SNIPET) available at http://srsfia2.fs.fed.us/SNIPET/. Any species with less than 50 total observations across all data were considered candidates for removal from the watch list. Each candidate species being considered for removal or addition was discussed in detail by the team. Removals and additions to the list were evaluated using the following general criteria: (1) the plant species is considered a known invader of forested systems; (2) the plant species is considered to be a regionally significant invader (or highly likely to become regionally significant) of forests; and (3) the plant species can be invasive to any stage of forest development.

RESULTS AND DISCUSSION

Candidate species for removal included Russian olive (*Elaeagnus angustifolia*), giant reed (*Arundo donax*), English ivy (*Hedera helix*), Chinese silvergrass (*Miscanthus sinensis*), and tropical soda apple (*Solanum viarum*). Candidate species for addition to the watch list were primarily from the species listed in Miller et al. (2010).

The following decisions were made with respect to each candidate species for removal:

(1) Russian olive—primarily due to difficulty in field identification, Russian olive will be combined with autumn olive (*E. umbellata*) to form the Elaeagnus group.

(2) Giant reed—due to low occurrence (3 subplots out of over 33,000) coupled with being found primarily on nonforest conditions, giant reed will be removed from the watch list.

(3) English ivy—although observed infrequently, an increasing number of observations over time suggests the need for continued monitoring. English ivy remains on the watch list.

(4) Chinese silvergrass—although observed infrequently, an increasing number of observations over time along with potential uses of *Miscanthus* spp. as a bioenergy crop suggests the need for continued monitoring. Chinese silvergrass remains on the watch list.

(5) Tropical soda apple—due to low occurrence coupled with being found primarily on nonforest conditions, tropical soda apple will be removed from the watch list.

Two plant species, Brazilian peppertree (*Schinus terebinthifolius*) and camphortree (*Cinnamomum camphora*), were elevated from the Florida-only watch list to the regional watch list. A total of 15 species were added to the watch list from Miller et al. (2010). A new species group, *Tamarix* spp., was added due to increasing evidence of saltcedar (*Tamarix ramosissima*) invasions in the western areas of the southern region.

The new SRS-FIA watch list (Table 1) contains a total of 49 species (or species groups) that will be monitored on all southern FIA plots beginning in October 2012 with the implementation of the version 6.0 field guide.

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Table 1.—Southern Research Station Forest Inventory and Analysis 6.0 nonnative invasive plant watch list

Scientific name	Common name	Scientific name	Common name
Ailanthus altissima	Tree of heaven	*Liriope* Group	
Akebia quinata	Five-leaf akebia, chocolate vine	*L. muscari*	Big blue lilyturf
Albizia julibrissin	Mimosa	*L. spicata*	Creeping liriope, Monkey grass
Alliaria petiolata	Garlic mustard	*Ophiopogon muscari*	
Ampelopsis brevipedunculata	Amur peppervine	*Lonicera* Group	
Ardisia crenata	Coral ardisia, Hen's eyes	*L. tatarica*	Tatarian honeysuckle
Bambusa Group		*L. maackii*	Amur honeysuckle
Phyllostachys aurea	Golden bamboo	*L. morrowii*	Morrow's honeysuckle
Phyllostachys spp.	Other invasive bamboos	*L. fragrantissima*	Sweet-breath-of-spring,
Bambusa spp.	Other invasive bamboos	*L.* x *bella*	Bell's honeysuckle
Berberis thunbergii	Japanese barberry	*Lonicera japonica*	Japanese honeysuckle
Broussonetia papyrifera	Paper mulberry	*Lygodium japonicum*	Japanese climbing fern
Celastrus orbiculatus	Oriental bittersweet	*Mahonia bealei*	Leatherleaf mahonia
Cinnamomum camphora	Camphortree	*Melia azedarach*	Chinaberry
Dioscorea Group		*Microstegium vimineum*	Nepalese browntop
D. bulbifera	Air yam	*Miscanthus sinensis*	Chinese silvergrass
D. oppositifolia	Chinese yam	*Nandina domestica*	Sacred bamboo
D. alata	Water yam	*Paulownia tomentosa*	Princesstree
Elaeagnus Group:		*Polygonum cuspidatum*	Japanese knotweed
E. umbellata	Autumn olive	*Poncirus trifoliata*	Trifoliate orange
E. angustifolia	Russian olive	*Pueraria montana*	Kudzu
Elaeagnus pungens	Thorny elaeagnus	*Pyrus calleryana*	Bradford pear
Eragrostis curvula	Weeping lovegrass	*Rosa* Group	
Euonymus alatus	Winged burning bush	*Rosa multiflora*	Multiflora rose
Euonymus fortunei	Winter creeper	*R. bracteata*	Macartney rose
Firmiana simplex	Chinese parasoltree	*R. laevigata*	Cherokee rose
Frangula alnus	Glossy buckthorn	*Rosa* spp.	Other nonnative roses
Hedera Group		*Schedonorus phoenix*	Tall fecsue
H. helix	English ivy	*Schinus terebinthifolius*	Brazilian pepper
H. hibernica	Atlantic ivy	*Securigera varia*	Crownvetch
H. colchica	Colchis ivy	*Spiraea japonica*	Japanese meadowsweet
Imperata cylindrica	Cogongrass	*Tamarix* spp.	Saltcedar
Lespedeza Group		*Triadica sebifera*	Tallowtree, Popcorntree
L. bicolor	Shrubby lespedeza	*Vernicia fordii*	Tungoil tree
L. thunbergii	Thunberg's lespedeza	*Vinca* Group	
Lespedeza cuneata	Chinese lespedeza	*V. minor*	Common periwinkle
Ligustrum Group 1		*V. major*	Bigleaf periwinkle
L. sinense	Chinese privet	*Wisteria* Group	
L. vulgare	European privet	*W. sinensis*	Chinese wisteria
L. obtusifolium	Border privet	*W. floribunda*	Japanese wisteria
L. ovalifolium	California privet		
Ligustrum Group 2			
L. japonicum	Japanese privet		
L. lucidum	Glossy privet		

Indented species are identified within a group.

LITERATURE CITED

Miller, J.H.; Chambliss, E.B.; Loewenstein, N.J. 2010. **A field guide for the identification of invasive plants in southern forests.** Gen. Tech. Rep. SRS-119. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 126 p.

Oswalt, S.N.; Oswalt, C.M. 2011. **The extent of selected nonnative invasive plants on southern forest lands.** In: Fei, S.; Lhotka, J.M.; Stringer, J.W.; Gottschalk, K.W.; Miller, G.W., eds. Proceedings, 17th central hardwood forest conference; 2010 April 5-7; Lexington, KY. Gen. Tech. Rep. NRS-P-78. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station: 447-459.