The Forestry Source

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DEPARTMENTS

Western Drought, Fewer Firefighters Ignite Worries about a Severe Fire Season

By *Source* Editor Steve Wilent

For wildland firefighters and incident commanders alike, forecasts like this can bring on feelings of foreboding, despite the usual eagerness to return to the fire lines or camps after the off season: "Severe drought conditions across the western United States had a significant effect on fuel conditions. Nearly all areas west of the Rocky Mountains, except the far northern tier, are experiencing both live and dead fuel moistures which are extremely low and raise the probability for severe early-season fire activity that will likely continue into summer." Such was the National Interagency Fire Center's outlook in May.

With such a forecast, the US Forest Service, Bureau of Land Management (BLM), and other federal agencies would naturally want to bolster the ranks of firefighters, ready additional engines and air tankers, and accelerate fuels-reduction and forest-health treatments. However, with less funding this year, due in part to the "sequestration" budget cuts that have affected all federal agencies since January, they'll have to do more with less.

"There are roughly 45 million acres in this country that require treatment. With restrained budgets we're doing everything we can to begin to restore as many of those acres as we possibly can," said Agriculture Secretary Tom Vilsack at a May 13 press conference. "We need stewardship contracting authority extended by Congress. We need to continue to fund the Collaborative Forest Landscape Restoration Program effort. We'll continue to put resources behind the bark beetle effort as well as the wood-energy projects. But the reality is that both [the Agriculture and Interior] departments are facing challenging budgets and, as a result of sequester and

*(See **"Drought"** page 3)*

Alan Clark

The Fawnskin Fire, on the San Bernardino National Forest in California, was one of several early-season fires that have fire managers worried about an active fire season across the West.

Introduced Species Found on Two-Thirds of FIA Plots in Northeast, Midwest

By Steve Wilent

It isn't news to foresters that there are many introduced species amongst the native plants in the forests they manage. However, they may be surprised by the results of an analysis of more than 1,300 Forest Inventory and Analysis (FIA) plots in the northeastern and midwestern United States: two-thirds of the plots had at least one nonnative plant species. Some of the 305 nonnative species identified are invasives that pose significant threats to native forest ecosystems, including the three most widely found species: multiflora rose (recorded on more than one-quarter of the plots), Japanese honeysuckle, and garlic mustard. Many of the others are innocuous, at least for now.

Forests in the Eastern Broadleaf ecological province—which runs from the Atlantic coastal plains of Maine and New Hampshire to the southwest into Ohio and

*(See **"Species"** page 4)*

Daniel Herms, The Ohio State University, Bugwood.org

Garlic mustard is thought to have been brought to North America by European settlers as an edible green. This invasive, nonnative plant was found on more than 10 percent of FIA plots in the Northeast and Midwest. It is found in 37 states, according to the Natural Resources Conservation Service.

Can We Have Our Biodiversity and Plantations, Too?

By Thomas Stokely, Matt Betts, and Stephen Fitzgerald

Global demand for wood resources is expected to double within the next 25 years, requiring approaches that maximize timber production on a limited land base. Intensive forest management (IFM) relies upon such practices as herbicide application, fertilization, and planting genetically improved trees to reduce rotational ages and maximize investment returns. IFM has become ubiquitous on private and state lands throughout the Pacific Northwest, and though IFM is becoming more common worldwide, the ecological costs are poorly understood. [Editor's note: For one perspective on this issue, see Manuel R. Guariguata's commentary, "What Do People Think? Finding Optimism in Tree Plantations," see page 5.]

The use of IFM to accelerate closed-canopy conditions shortens the early seral stage of succession (grass-forb-shrub stage) by targeting competing vegetation with herbicides (see Figure 1). Highly competitive and floristically diverse early-seral plant communities thrive in post-harvest conditions, providing important forage and cover for many wildlife species. Herbicide applications may there-

*(See **"Biodiversity"** page 6)*

Species

(continued from page 1)

into the high hills and semi-mountainous areas of West Virginia—were found to contain the greatest assortment of introduced plant species, according to the agency.

The data were gathered throughout a 24-state region by the Northern Research Station's FIA Program, on Phase 3 (P3) plots—a subset of the regular FIA P2 plots—from 2001 to 2008. One P2 plot is established and measured on every 6,000 acres; one in 16 of those plots is also a P3 plot, where measurements include a complete vegetation inventory (also called the vegetation indicator), which includes all trees, shrubs, vines, herbs, grasses, ferns, and fern-like plants, as well as tree and crown conditions, soil data, lichen diversity, the quantity of coarse woody debris, and ozone damage.

An analysis of the data was presented in "The New Flora of Northeastern USA: Quantifying Introduced Plant Species Occupancy in Forest Ecosystems," by Bethany K. Schulz and Andrew N. Gray, in a recent edition of *Environmental Monitoring and Assessment*. Schulz, who led the study, is a research ecologist at the Pacific Northwest (PNW) Research Station's office in Anchorage, Alaska, and is the agency's National Vegetation Indicator adviser. She has been with the PNW Research Station since 2001. Gray is a research forester at the station.

I recently talked with Schulz to learn more about the inventories as well as her and Gray's findings and what they tell us about introduced plant species. What follows is a portion of that conversation.

Top 10 Introduced Species in the US Northeast and Midwest

Species	Common Name	Plots (%)
Rosa multiflora	multiflora rose	27.5
Lonicera japonica	Japanese honeysuckle	10.1
Alliaria petiolata	garlic mustard	7.1
Daucus carota	Queen Anne's lace	6
Glechoma hederacea	ground ivy	5
Phleum pratense	timothy	4.9
Phalaris arundinacea	reed canarygrass	4.8
Hieracium aurantiacum	orange hawkweed	4.5
Leucanthemum vulgare	oxeye daisy	4.5
Berberis thunbergii	Japanese barberry	4.4

The top 10 species by percentage of plots where the species was found. Data from "The New Flora of Northeastern USA: Quantifying Introduced Plant Species Occupancy in Forest Ecosystems," by Bethany K. Schulz and Andrew N. Gray, *Environmental Monitoring and Assessment* (2013) 185:3931–3957.

Were you surprised that two-thirds of the plots had at least one introduced species?

Yes, at first it was a big surprise. And then when we started looking at what species were coming out as introduced. When you're dealing with thousands of plots and tens of thousands of species, you need to go to a database to sort things out and find which species are introduced and which are native. We used the Natural Resources Conservation Service's Plants Database to look for introduced species. We had to narrow the field, because there are many species that are natural in some areas and introduced in others. We tried to be conservative in determining which were the introduced species.

And there are many species that people aren't aware are introduced, such as the grass timothy, which is easily recognized, and other benign species like common plantain. They are indeed introduced species, but not every introduced species turns out to be a nasty ecosystem transformer. Many of the ones that do become transformers started off as introduced species, and sometimes they sit around in the environment for quite a while before something happens—some sort of disturbance—that lets them start to gain ground and become more successful. It can be many years before they are recognized as being a species that may be of concern. With the development of forest lands, insect outbreaks, climate change, and other factors, it pays to have an understanding of the species that are present.

The data in your report were collected between 2001 and 2008. Did FIA inventories include data about introduced species before that period?

Some regions have been collecting information about invasive plants. The Southern Research Station has had a program going on for years, where they would record up to four introduced invasive species per plot, so they were getting an idea of where the nasty invasives were. Other regions would collect limited information on understory vegetation on their regular P2 plots, so if an invasive species was there with enough abundance to warrant recording it, they might catch it that way. But there wasn't any kind of all-species inventory before this.

Is this all-species inventory standard now on P3 plots?

No, right now it isn't. In 2010 the P3 data collection was suspended due to budget constraints. That's not to say that they are completely off the board, but it's just that in this time of budgetary constraints, they're waiting for folks with special projects who might want to come forward and fund the P3 data collection. The veg indicator is a great protocol, and there's so much more that we can do with those data.

Is P3 inventory especially costly?

The biggest cost for the veg indicator is that it requires a person dedicated to collecting those data on the plot, and they don't usually have time to help with other P2 measurements. This required each region to figure out how to hire qualified botanists to get out there on those plots. It takes someone with special skills and training.

Are any data about invasive species collected on P2 plots?

FIA does have a protocol for looking for invasive species on the regular P2 plots, but those inventories are limited to a list of species, lists that are pretty much different around the country. Each region—and in some cases each state—has a unique list of species that they feel are important to monitor for. But you're not getting the whole gamut of all of the species that are out there, and if there is an invasive on a plot that doesn't happen to be on the list, it doesn't get recorded.

Another way to get at introduced or invasive species is through the P2 vegetation profile. FIA program managers have encouraged us to come up with a light version of the P3 veg indicator that isn't so intensive and that a field crew member could do in maybe 15 minutes or so per plot. So we've developed a P2 veg protocol that can be very basic, because some states feel that they can't deal with introduced species at all and are just collecting cover by growth habits. Other states that want more species data can collect up to four species per growth habit, if coverage is up to 3 percent of the subplot. They could conceivably collect up to 16 species per subplot, if there are that many that have that much coverage. So they can pick up introduced species in that way, but it's not a complete census of all the plants that are on the plot, and that really is the key to this type of analysis.

What's next in your line of research?

I have veg data from about 500 plots that have been remeasured at least five years after the first inventory, and I'm starting to look at those to see what kind of change we can detect. I'm also working with some groups that have these data—it's publicly available—that are looking at long-term nitrogen deposition and how that might have influenced species richness and composition. And we have a couple of years' worth of P2 veg data, so we're starting to look at how we can use those.

Erratum

In "News Briefs: Biomass Generator, Timber Taxes, USFS Project Reviews, Governor's Plea" (May 2013), we mistakenly reported that Virginia Tech developed a portable biomass-fueled generator. According to Henry J. Quesada-Pineda, assistant professor in Virginia Tech's Department of Sustainable Biomaterials, the device was not developed at the university, which uses it for research and demonstrations on how to convert biomass into clean electricity. Rather, it was purchased from All Powers Lab, a company based in Berkeley, California. We apologize for the error.