

# Technology in large-scale invasive species programs:

# The State of Alabama VS. Cogongrass

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An untold number of species are introduced into new environments every day. Anyone can be the unwitting host of a non-native species when we return from a trip abroad or even a few miles from home. This has occurred for ages and continues as the world's borders become more porous in this global economy, even with programs in place to slow their spread. In most cases these species meld into the landscape, and we in our daily living are none the wiser. However, non-native species can have significant negative consequences on native ecosystems, water and nutrient cycles, public safety, and economies. They alter the natural landscape in ways that in extreme cases result in nearly complete replacement of local species. These are commonly referred to as invasive species.

Alabama has become the reluctant host of numerous invasive species that assault our state from the sandy beaches of Fort Morgan to the Tennessee border. One of these species is cogongrass (*Imperata cylindrica*), a perennial grass from Southeast Asia accidentally introduced a century ago. Several recent articles in *Alabama's TREASURED Forests* have outlined what a significant problem this highly invasive grass species has become. In addition, there are hundreds of other publications as well as web resources that serve as clearinghouses of information (see end of article).

What I want to present is one approach to addressing cogongrass in Alabama on a scale never seen before, using advances in GPS and GIS technology. This work was made possible by a 3-year, \$6.2 million American Reinvestment and Recovery Act (ARRA) grant awarded in 2009 to the Alabama Forestry Commission and coordinated by Larson & McGowin of Mobile. Being a "stimulus" project the primary objective is job creation.

All other objectives focus on fighting cogongrass infestations statewide through documentation, treatment, monitoring, and network building.

## Invasive Species Programs: The Dilemma of Scale

Any species adapts to a local environment by establishing itself wherever and whenever it can. Humans have been successful over the millennia in this regard. An invasive species, however, may have a very distinct advantage over that of local species, and that is evolution. More specifically, the advantage is a *lack* of evolution with native species: no natural enemies yet to partake in the long, unremitting give-and-take of competitive interaction.

Addressing invasive species is no easy task, especially considering that we are sometimes at a disadvantage from the start. Invasives create their own obstacles to good management in several ways. First, landowners may have to adapt commonly accepted silvicultural practices to the unique characteristics of an invasive species. Second,

*A scout contractor hired by the Alabama Cogongrass Control Center (ACCC) collects a cogongrass spot's information on a handheld GPS.*



money and time otherwise spent on primary management objectives must be reallocated. Third, an invasive species treatment program typically focuses on a single species while others abound or are waiting in the wings. Fourth, there is a paucity of funding to directly address the root causes of *why* and *how* invasive species migrate to new areas. And funding for invasive species programs have lacked the consistency and scale needed over very long periods to be completely successful at eradication.

The scientific and management communities bear some of the responsibility for these obstacles. There are few people who could be considered true experts in invasive species. The experts and consultants are still determining the best treatment and rehabilitation options for a single species. What might work on one site may not work on an adjacent site, which can consume time, money, and sanity. But funding waxes and wanes, and results can take many years to publish and be disseminated to the public. This leads to an overwhelming number of treatment scenarios and inconsistent messages from well-meaning sources.

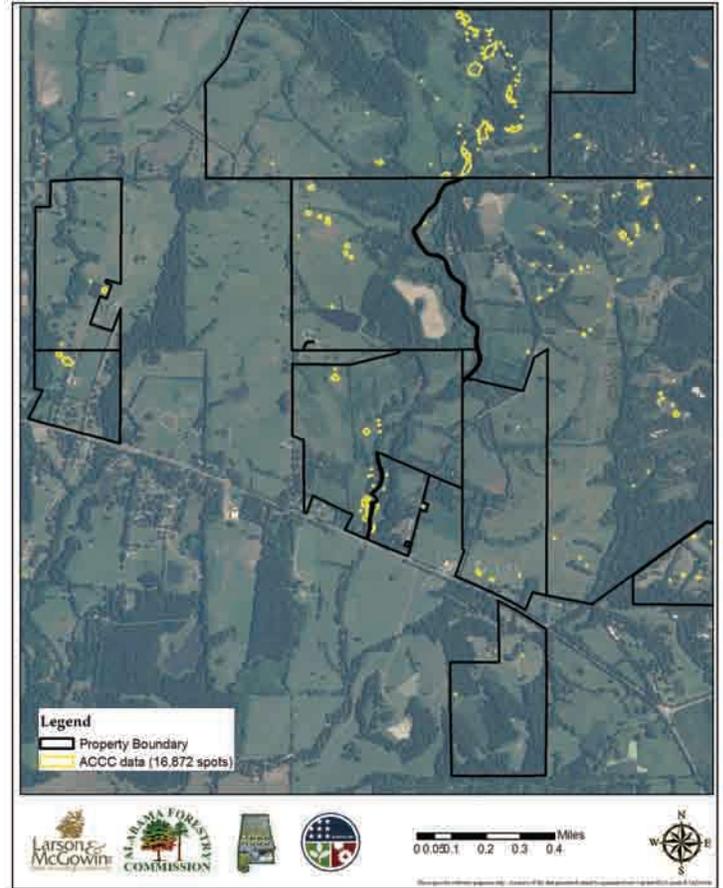
Because of the nature of funding “finiteness,” objectives must be pinpointed to maximize any gain. Invasive species programs that focus on a small scale are relatively easy to address. You specify the location and species of interest, allocate or secure resources, and execute the plan. I recently attended an international conference where many of the participants were focused on small-scale invasive species programs such as Japanese honeysuckle on a 20-acre nature center.

However, there is a positive and exponential relationship between scale and complexity of an invasive species program. The scale metric could be locales, time, funding, species, or any multitude of parameters. In the case of this cogongrass program, the first three metrics apply: the entire state is covered, it is over multiple years, and the funding allows for a small army of field staff, each with unique responsibilities. Ultimately the Cogongrass State Task Force that guides all of our efforts has pinpointed regions, land cover types, and many other factors in order to maximize the program’s footprint across the state. This includes making the hard choice of who can be helped with limited funding.

A large-scale invasive species program is complex because several questions must be addressed at an operational level that encompasses varying legal ownerships, management objectives, political boundaries, eco-regions, and many other factors. Critical questions we asked ourselves at the beginning of this venture included:

- What is the target species, and who is the target audience?
- How much funding is needed, and how much is available?
- How many personnel are required?
- How is the target species detected and documented?
- How is it treated?
- How are datasets managed?
- How is monitoring and auditing performed?
- What are quantifiable measures of success?
- How can lessons learned be incorporated into future work?

In considering these questions, we knew the only way a program of this scale could succeed was with GPS and GIS technology. GPS stands for Global Positioning System. Most people use this technology to find their location or to determine a trip itinerary (car navigation systems, for example). GIS stands for



*A close-up of a group of properties in central Alabama demonstrates that cogongrass is found on many sites and varies in extent. Spots documented to-date range from one foot across, up to several hundred acres.*

Geographic Information System, and it is a mix of what we refer to as *spatial* data (how pieces of a map relate to each other) and *tabular* data (specific information about that location such as a city’s population). These are linked together through stringent rules, creating a very robust analysis and map-creation tool. GPS and GIS are used every day by public safety officials, city planners, foresters, or anyone that needs information at multiple levels to make well-informed decisions.

We have had a cadre of professional services available to us throughout this program. Silvics Solutions LLC, located in Birmingham and a subsidiary of Larson and McGowin, has provided our program with key GIS technology needed to manage the voluminous data coming in daily from the field. Tri-Global Technologies LLC, located in Athens, Georgia has enabled us to use cutting-edge GPS hardware and software in the field. Finally, there is the field staff doing the documentation, treatment, and monitoring of cogongrass infestations statewide using GPS units provided by Tri-Global and customized by Larson and McGowin. In essence, our field staff is divided into three groups: scouts, applicators, and inspectors. They are hard workers, and most hold professional certifications for their vocation such as being a registered forester in Alabama. They are the unsung heroes of this program, and we simply could not do any of this without them!

*(Continued on page 12)*





*A young plantation greatly infested with cogongrass. Small, circular cogongrass patches eventually melt into one another.*

Commission had already documented over 7,000 spots prior to this program, and they have added over 1,000 since. Other agencies — and even private landowners — have shared some of their cogongrass data with us, bringing the total number of documented cogongrass spots in Alabama to nearly 30,000 to-date! This collegial sharing of information and lessons learned with public agencies is a logical step, broadening the footprint of the program and strengthening relationships with others involved in the fight.

Ultimately the GIS helps pinpoint future funding needs, efficiently manage financial and human resources, and determine which treatments were most effective in the long run. But the real beauty of what we have been able to accomplish with this technology is that it is scalable depending on funding, from a handful of staff to a region-wide, multi-agency campaign. Moreover, the approach is applicable to practically anything requiring field data collection and centralized data management — be it additional invasive species, wildfires, timber harvesting, road or powerline maintenance, wildlife populations...the list expands daily.

The initial funding for this program ends next year, and we will continue to document and treat sites to that point. We are actively pursuing additional funding to keep the program going and hopefully expand past Alabama. Many agencies have expressed interest in this integrated, simple, and auditable approach we have created using modern technology against an old pest. We still have a long way to go, but together we can defeat this most unwelcome visitor.

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## In Conclusion

My wife and I recently received a gift from a friend of ours in Nanafalia, Alabama. Joey Van Dee, who happens to be one of the cogongrass scouts, makes spectacular jelly as one of his many side projects. As I delighted at the sight of the 12 Mason jars, each with a different flavor of jelly, I was amused to see one jar with the label “Kudzu Flower Jelly.” I realize not everyone may understand the irony of my partaking in such a guilty pleasure. For me it was a reminder that we may have a long way to go before invasive species become part of our history, and not part of our landscape. 🙏

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## Web Resources

[www.alabamacogongrass.com](http://www.alabamacogongrass.com)  
[www.cogongrass.org](http://www.cogongrass.org)  
[www.eddmaps.org](http://www.eddmaps.org)  
[www.forestryimages.org](http://www.forestryimages.org)  
[www.forestry.alabama.gov/Viewers/afc\\_cogongrass\\_viewer.aspx](http://www.forestry.alabama.gov/Viewers/afc_cogongrass_viewer.aspx)  
[www.recovery.gov](http://www.recovery.gov)  
[www.silvics.com](http://www.silvics.com)  
[www.triglobal.net](http://www.triglobal.net)