

Wildland Weeds

FALL 2010

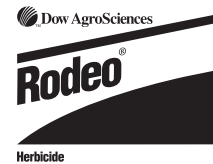


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Wildland Weeds

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The mission of the Exotic Pest Plant Councils is to support the management of invasive exotic plants in natural areas by providing a forum for the exchange of scientific, educational and technical information.

An **exotic plant** has been introduced, either purposefully or accidentally, from outside of its natural range. A **naturalized exotic plant** is one that sustains itself outside of cultivation (it is still exotic; it has not "become" native). An **invasive exotic plant** not only has become naturalized, but is expanding its range in native plant communities.

Wildland Weeds (ISSN 1524-9786) is published quarterly by the Southeast Exotic Pest Plant Council (SE-EPPC) and distributed to members to provide a focus for the issues and for information on exotic pest plant biology, distribution and control. The Charter issue of *Wildland Weeds* was published by the Florida Exotic Pest Plant Council in Winter 1997.

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On the Cover:

David J. Moorhead stands in a dense thicket of Chinese privet (*Ligustrum sinense*). See Tim Albritton's article on page 5. Photo by Chuck Barger, courtesy of University of Georgia, Bugwood.org.

From the Editor

I'm often led to consider just who our readers are because I receive such a wide array of articles for *Wildland Weeds* magazine. While most editors assume a consistency in the knowledge level of their readers, I think the variety of content in *Wildland Weeds* helps to illustrate how much diversity there is in the folks who fight against invasive weeds in natural areas. This issue features a herbicide treatment method for controlling Chinese privet in Alabama, a newly established invasive vine in North Carolina, and a recently discovered non-native aquatic plant spreading at an alarming rate in Florida. We also include an economic evaluation of invasive weeds in Florida state parks, and a volunteer education and outreach effort from one of those parks. Several state chapters of SE-EPPC have provided updates on their activities and several conferences are in the planning phase for 2011, including another national meeting in Washington, DC. In addition to the varied geographic coverage, this issue demonstrates diverse areas of expertise: economics, new floristic records, hard-core botany, exotic pest plant management, non-profit group efforts and university extension. While we seek cohesion and embrace teamwork, we fight invasives because we believe in diversity, and that is what *Wildland Weeds* is all about.

— Karen Brown

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February 28 -
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A week of activities, briefings, events, and workshops to highlight the economic, environmental, and social threats of invasive species. What have we achieved and what more do we need to do to protect our nation's ecosystems and economy from invasive species?

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- State Invasive Species Council and Regional Coordination Workshop
- National Press Club Announcement of National Invasive Species Agenda
- Briefings on regional invasive species issues (Great Lakes, Southeast, West, Northeast)
- Reception and educational program at the United States Botanical Garden
- Reception and educational program at the National Aquarium
- MORE TO COME!

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Clearing a Path Through Bottomland Hardwoods Using the Basal Bark Treatment Method

by Tim Albritton

Alabama's bottomland hardwoods are rich in diversity and filled with beauty, providing fantastic wildlife habitat. These swamps found along rivers and streams also protect our waters by filtering run-off within the watershed. There is a problem, however, because to see them you often have to hike through a mass of exotic shrubs invading these areas. You don't have to be an invasive plant expert to find this pest that is spreading throughout the state and, for that matter, the southeastern U.S.

Chinese privet (*Ligustrum sinense*), often called "common privet," was introduced into this country from China in 1852 as an ornamental shrub. The spread of privet is escalating in Alabama's bottomland hardwoods, but most landowners are unaware of its invasion. It really becomes a problem after a timber harvest. Having already been established for years, privet growth explodes once the mature overstory trees are removed. If you wait until after your timber harvest to address the problem, you have waited too long. Prescribed burning at regular intervals will effectively control privet in pine forests. However, prescribed burning is not an option in bottomland hardwoods.

The easiest way to control privet in bottomland hardwoods is with herbicides, before a timber harvest. This shrub is fairly easy to control with a number of herbicides and three common treatment methods: foliar spray, cut stump, and basal bark. Each of these methods has advantages and disadvantages. The purpose of this article is to highlight my experience with the basal bark treatment method.

I have tried all three methods on my own property along the Tallapoosa River in Elmore County, Alabama. When I stated that privet explodes after a timber harvest, I was speaking from experience, or what I term my "lessons learned the hard way." Since I harvested a small stand of hardwoods in 1996, I have been spending weekends battling the privet invasion. Having spent most of my time using the foliar spray and cut stump treatment methods, I decided to give the basal bark treatment method a try.

I chose a herbicide from Dow AgroSciences called Pathfinder II. It is labeled for the control of woody plants in the forest, and privet is one of the 95 species listed on the label. I like the Pathfinder II herbicide for a number of reasons: it comes ready-to-use (no mixing is required), and it can be used in the cut stump treatment method as well. The herbicide can be applied any time, including winter. If you have ever tried working in bottomland hardwoods during



Especially visible in winter, Chinese privet forms dense thickets in bottomland hardwoods.



Ligustrum sinense fruit in January.

PHOTOS BY JIM MILLER, COURTESY OF UGA BUGWOOD.ORG

the summertime in Alabama, you can readily appreciate that aspect. Another advantage to treatments in the dormant season is that privet is easily identified. Most of the native hardwoods in the bottomland are deciduous (naturally shedding their leaves in winter), but privet is an evergreen. It stands out like a horse in a dog race.

I found the basal bark treatment method to be fairly easy. I didn't have to spray all of the foliage as with the foliar spray method or cut the tree down as with the cut stump method. With the basal bark treatment method, the herbicide is sprayed down low at the base of the tree, which reduces the amount of drift. The herbicide should be sprayed around the entire circumference, completely covering the bark from the ground level to a height of 12 to 15 inches. The herbicide penetrates the bark into the living tissue (cambium) where it is transported through the tree into the roots and leaves. This treatment provides a fast and effective method of controlling selected trees and shrubs.

Before you grab your sprayer and head out into the woodlands, it is good to familiarize yourself with some other non-native invasive species. While you are controlling privet, you can treat them, too. Some additional pest plant species in central Alabama include silverthorn or thorny olive (*Elaeagnus pungens*), tallowtree (*Triadica sebifera*), chinaberrytree (*Melia azedarach*), princess tree (*Paulownia tomentosa*), and silktree (*Albizia julibrissin*). If I were a betting man, I would bet a dollar to a doughnut you have one or more of these species on your property.

You can find information on all of these species in *A Field Guide for the Identification of Invasive Plants in Southern Forests*, available at <http://www.treesearch.fs.fed.us/pubs/35292>. A free copy may be requested online. My good friend, Dr. James Miller, is the author of the book and a Research Ecologist with the USDA Forest Service, Southern Research Station at Auburn University, Alabama. I encourage you to check out Jim's books and learn more about invasive plants in beautiful Alabama.

I have served with Jim and other concerned resource professionals on the Alabama Invasive Plant Council (ALIPC), www.se-eppc.org/alabama/. If you are not a member of the ALIPC, please consider joining us in our efforts.

Tim Albritton, NRCS State Staff Forester, Tim.Albritton@al.usda.gov



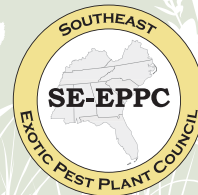
Treating Chinese privet using the basal bark treatment method.



One year after treatment, the tree is dead.

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Value of Weed Management for Nature-Based Outdoor Recreation

by Damian C. Adams and Donna J. Lee

Background

Invasive exotic weeds are a serious problem for Florida's natural areas. To date, an estimated 124 different invasive exotic weed species (74% upland species) have established in state parks and other natural areas (FLEPPC, 2007). Despite public spending of \$92 million between 1997 and 2007, invasive exotic weeds infest 1.5 million acres of Florida's public conservation land, impacting upland ecosystems and threatening biodiversity (FDEP, 2007). In the absence of adequate prevention, monitoring, and management, new exotic weeds will become established and existing exotic weeds will spread.

Among the economic sectors at risk is Florida's nature-based tourism and recreation industry valued at nearly \$8 billion per year (FDEP, 2007). Invasive weeds can diminish the quality of recreation in natural areas and reduce the frequency of repeat visits (Adams and Lee, 2007). However, because invasive weeds are difficult and costly to manage, state weed control programs are often underfunded (Lee et al., 2009). According to the U.S. General Accounting Office (2002), estimates of the economic damages caused by invasive exotic weeds can help justify increased funding.

Nature-based outdoor recreation survey

With support from a Florida Department of Environmental Protection Bureau of Invasive Plant Management research grant, we conducted a study to quantify the economic impact of invasive weeds on nature-based outdoor recreation. We surveyed Florida residents to find out how weeds diminish their outdoor recreation experience and how much more residents would pay to visit a park that is free of weeds and vegetated with native plants versus a park infested with weeds. The survey method we employed has widely been used to study the value of natural resources and environmental amenities.

We sent a web link to Florida residents to identify recreationists who had visited an upland or wooded park during the past 12 months. To determine preferences and quantify economic values we developed a series of questions asking respondents to choose between pairs of *conceptual* parks with different characteristics as illustrated in Figure 1. We asked respondents to assume that the parks were equal in every way except for changes in key attributes that vary in quality or quantity. In our case, parks differed by invasive plants, entrance fees, quality and type of facilities, and native animal and plant species. The quantity or quality levels of each attribute (e.g., "Excellent" versus "Minimal" facilities) were selected according to established survey design methods. Attribute levels were: (1) facilities – minimal, adequate, or excellent; (2) diversity of animal species – low, moderate, or high; (3) diversity of plant species – low, moderate, or high; (4) presence of invasive plants – none, few and dispersed, or numerous and dense; and (5) fee for park use – free, \$10, \$20.

In the end, 1,436 Florida residents completed our web survey. We conducted a statistical analysis of the responses and found that Florida residents are willing to pay more for a nature park with natural or restored native vegetation that is free of invasive weeds. On average, Florida residents will pay \$10.82 more to visit a park that is free of invasive weeds compared to a park that is densely populated with weeds. If the park is also rich in native flora, residents would pay an additional \$7.46. Combining these, Florida residents would pay \$18.28 more to visit a pristine nature park that is both rich in native flora and free of invasive weeds. While Florida residents are typically not required to pay steep fees to visit nature parks, outdoor enthusiasts will often drive long distances to visit pristine areas and thus pay in both time and gas. Outdoor enthusiasts who are knowledgeable about the damages caused by invasive weeds through personal experience or other means likewise have a strong preference for pristine nature parks

PARK CHARACTERISTICS	PARK A	PARK B
Condition of park facilities such as parking, picnic areas, and restrooms	Excellent	Adequate
Diversity of natural and indigenous plants	High	Low
Presence of invasive exotic weeds	None	Numerous and dense
Fees for park entrance, parking, and camping	\$20	Free
Which park do you prefer? <input type="checkbox"/> PARK A <input type="checkbox"/> PARK B		

Fig. 1

and would pay \$19.94 more per visit compared to a non-pristine park. Outdoor enthusiasts who have contributed time or money to remove weeds and restore vegetation have a greater disdain for invasive weeds than the average resident and would pay \$23.22 more to visit a pristine nature park versus a park lacking in native vegetation and overrun with weeds.

Our survey respondents also let us know that Florida residents appreciate facilities and are willing to pay to visit parks with constructed amenities. On average, Florida residents will pay \$7.44 more to visit a park with good quality facilities such as picnic areas, parking, and well maintained restrooms compared to a park that offers poor facilities. When these results are taken together, outdoor enthusiasts who are knowledgeable about the damages caused by invasive weeds would pay \$27.38 more to visit a pristine park with quality facilities than they would pay to visit a park that is not pristine and deficient in facilities. Further, outdoor enthusiasts who have contributed time or money to weed removal and restoration would pay \$30.66 more to visit a pristine park that lacks invasive plants, has rich native flora, and offers quality facilities than they would pay to visit a park that is overrun with invasive plants, has few native plants, and is lacking in facilities.

Based on annual attendance at 115 Florida State parks and the need for funding to control invasive weeds, we estimated that local residents would pay an additional \$52.9 million annually for weed removal and native plant restoration in state parks and non-local visitors would pay an additional \$98.2 million for a total value of \$151 million for annual weed removal and native plant restoration in state parks.

Summary

Florida's unique ecosystems are the foundation of a nature-based tourism and recreation industry that generates \$8 billion per year for the local economy. Invasive weeds threaten ecosystem biodiversity and are therefore of serious ecological and economic concern. The state's 11 million acres of public conservation land have been under maintenance control since 1997. If a lapse of

funding should occur, invasive weeds on 1.5 million acres could threaten 9.5 million acres of public conservation land. Based on Florida's 115 upland state parks with 16.5 million total visits per year, our study estimates that residents would pay \$151 million for maintenance weed removal and native plant restoration in state parks.

Florida residents place a high value on outdoor recreational activities in natural areas and have an awareness and appreciation for native vegetation. Additional funding for research and control of invasive weeds in natural areas may well be justified.

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Another Invasive Vine Strangles North Carolina: Mile-a-minute vine (*Persicaria perfoliata*) by Rick Iverson



DAN WALL, NCDA&CS

Figure 1. Infestation along Highway 221 in Alleghany County near Sparta, NC.



RICK IVERSON, NCDA&CS

Figure 2. MAM covering a Fraser fir Christmas tree.

Persicaria perfoliata (previously known as *Polygonum perfoliatum*) is listed in North Carolina as a Class A Federal Noxious Weed, which means it is a harmful non-native weed that was not confirmed as being established in North Carolina – *until now!* It was first noticed on June 12, 2000 by Plant Pest Specialist, Dan Wall, as a contaminant with potted hosta plants in two shade houses in southern Wake County, North Carolina. Recently, a naturalized population of mile-a-minute vine (MAM) was documented by Appalachian State University botanist, Derick Poindexter, on what was originally thought to be three distinct populations in natural and roadside habitats (Poindexter 2010) (Figure 1). However, delimiting surveys by the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) have shown that all three of the populations were connected along the Elk Creek stream corridor which drains into the New River near the Virginia border with North Carolina.

Habitat And Biology

Mile-a-minute vine is an annual herbaceous trailing vine that is indigenous to Asia, where it is widely distributed. It was first reported in the United States in Portland, Oregon in the 1890s. It was thought to have been introduced to the eastern United States in the mid-1930s at the Gable Nursery in Stewartstown, Pennsylvania, as a contaminant in holly seeds from Japan (Hough-Goldstein et al. 2009). As indicated by the common name, MAM grows rapidly and can quickly smother, weaken and potentially kill shrubs and other vegetation in native plant habitats. It also has the ability to cover tree seedlings and farmed Christmas trees, slowing their growth, reducing their quality and interfering with management operations such as pruning (Figure 2). MAM is not very tolerant of heavy shade and prefers disturbed mesic sites exposed to the sun. Common habitats for MAM include roadsides, pastures, cleared forests, croplands, nurseries and natural areas such as bottomland riparian corridors.

MAM seed can be dispersed by animal vectors such as deer and rodents, and the buoyant fruit can be dispersed by moving water. It is highly probable that the North Carolina infestation along the Elk Creek corridor spread by movement of the fruit in the flowing water, especially during flooding events. The source of the initial infestation is not known for certain, but the importation of contaminated hay from infested fields is a plausible explanation. Seed can remain viable in the soil for up to six years (Hough-Goldstein et al. 2010). Consequently, control programs need to include annual surveys and spring treatments before seed production for at least six years.

Identification

MAM has several distinguishing features that help in identification. Leaves are alternate and triangular-shaped and the stems, petioles and leaf veins are covered with small, backward-projecting, recurved barbs. The plant also has distinctive, saucer-shaped leafy structures (ocreae) that surround the stem at each leaf node (Figure 3).

Each fruit encloses a single, hard, shiny, black seed (achene) (Figures 4 & 5).

A key to help differentiate MAM from similar native congeners in North America has been provided by Derick Poindexter (Poindexter 2010).

Proposed Management

Since the infestation is too large to eradicate, the NCDA&CS is planning to change the regulatory status of MAM to a Class B noxious weed. As a regulated species, articles that could contain MAM would have to be cleared with a phytosanitary certificate before they could be moved from the regulated MAM area. It is hoped that a quarantine boundary can be easily described that will include a portion of Alleghany County, rather than the entire county.

Figure 3. Distinctive triangular-shaped leaf and the ocreae of MAM.

Among other actions to help contain this invasive pest plant is a plan to release a weevil, *Rhynoncomimus latipes*, in the spring of 2011, in cooperation with Richard Reardon, manager of the biological control program for the Forest Health Technology Enterprise Team (FHTET) and Judy Hough-Goldstein, with the Department of Entomology and Wildlife Ecology, University of Delaware. The weevil is being successfully mass-reared for use in promising MAM control programs (Hough-Goldstein et al. 2010).

The North Carolina Department of Transportation has been informed of the MAM infestation and will be cooperating with the NCDA&CS to spray herbicides on infestations along roadside corridors. The North Carolina DOT also plans to discontinue mowing where MAM infestations intersect with regular mowing sites to prevent the potential spread of propagules by equipment.

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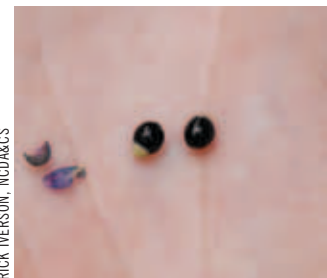


RICK IVERSON, NCDA&CS



DAN WALL, NCDA&CS

Figure 4. Iridescent blue berries about 1/4" across.



RICK IVERSON, NCDA&CS

Figure 5. Seeds or achenes.

CALL FOR PRESENTATIONS AND POSTERS

Joint Annual Meeting Kentucky Invasive Species Working Group and the Southeast Exotic Pest Plant Council

May 3-5, 2011 • Lexington, KY • <http://invasives2011.org>



The 2nd annual conference of the Kentucky Invasive Species Working Group and the 13th annual conference of the Southeast Exotic Pest Plant Council will encompass topics related to the research, management, outreach, education, and policy of invasive species in the eastern and central regions of the United States. We welcome contributions in the following major areas:

1. Ecology of invasive species and their impact on ecosystem functions and processes
2. Invasive species management
3. Invasive species education and policy

Submission of Abstracts

- Deadline for oral and poster presentation abstract is February 7, 2011
- Please submit your abstract electronically via <http://invasives2011.org>, including the following information (1) type of submission – Oral Presentation or Poster, (2) title of the submission, (3) the author(s) and their affiliations, (4) corresponding author's title, affiliation, phone number, and email address, and (5) abstract (250 words or less).

Publication

- The conference will publish electronic proceedings. All presenters are encouraged to submit a full-length paper.

IMPORTANT DATES

For oral presentation

- Feb. 7, 2011 – Abstract due
- Feb. 14, 2011 – Acceptance notification
- May 3, 2011 – Draft proceeding paper due

For poster presentation

- Feb. 7, 2011 – Abstract due
- Feb. 14, 2011 – Acceptance notification

Conference Co-chairs

Songlin Fei, University of Kentucky
859-257-9760 • ukinvasive@gmail.com

Joyce Bender, Kentucky State Nature Preserves Commission
502-573-2886 • Joyce.Bender@ky.gov

Please visit the conference web site at <http://invasives2011.org> for updates and conference information.

CHAPTER UPDATES

Florida EPPC – 2011

FLEPPC will be co-hosting their 2011 annual symposium with the Florida Native Plant Society (FNPS). The FLEPPC symposium will take place in Maitland, Florida from May 17-20 and the theme will be *Exotics on the Run — Leveling the Playing Field for Native Species*. The last two days of the FLEPPC symposium will be shared with the FNPS event. The FNPS has a large, active and motivated membership and FLEPPC looks forward to the interchange of strategies and ideas.

Visit the website for details: www.fleppc.org

FLEPPC Kathy Craddock Burks Education Grant – 2011 Request For Proposals

The Florida Exotic Pest Plant Council is soliciting grant proposals for non-native invasive plant education and outreach projects in Florida. These grants provide funding to organizations or individuals who will educate Floridians about non-native invasive plants and their influences on the environment and economy of Florida.

Proposals should involve plants on the FLEPPC 2009 List of Invasive Plant Species (see www.fleppc.org), include an educational message that will reach a large segment of the community, and heighten community awareness about non-native invasive plant identification, management, prevention, environmental and/or economic impacts.

Instructions for proposal submission, a list of past projects funded, and further information may be found on the FLEPPC website (www.fleppc.org/edgrants.html). Applicant/organization must present a summary of results at the FLEPPC annual meeting (poster or presentation) or provide a summary article for *Wildland Weeds* magazine.

The deadline for proposal submission is 5pm on Friday, April 1st, 2011. Winners will be announced during the business meeting at FLEPPC's annual conference in May.

For further information, contact committee chair Jennifer Possley, jpossley@fairchildgarden.org



Georgia EPPC Update

by Karan Rawlins, President Elect

Holding the GA-EPPC 2010 Annual Meeting and Conference at Zoo Atlanta had distinct advantages. Not only was it a wonderful location, but we were able to watch the “Pandacam” during breaks and view the giant panda mom and her day-old newborn. The theme of the conference was *Invasive Plants: The Impact on Georgia's Ecology and Economy*. Presentations covered a wide range of topics from “Invasive Species and The Lady Bird Johnson Wildflower Center” by keynote speaker Dr. Damon Waitt, Senior Botanist and Director of the Native Plant Information Network at the Center in Austin, to “Bio-fuels and Invasive Plant Issues” by Dr. David J. Moorhead, Professor of Silviculture at the University of Georgia's Warnell School of Forestry and Natural Resources and the Co-Director of the Center for Invasive Species and Ecosystem Health. Other speakers included Matt Nespeca, Marketing Manager for Nufarm Americas Inc.; Lee Patrick, co-owner of Invasive Plant Control, Inc.; Jimmie Cobb, Forestry & IVM Sales Specialist for Dow AgroSciences; John and Lamyrl Atkinson, owners of Towaliga Plants in Juliette, Georgia; and Karan Rawlins, Invasive Plants Coordinator at the Center for Invasive Species and Ecosystem Health at the University of Georgia. You can view all the presentations from the meeting on the GA-EPPC website at <http://www.gaepcc.org>.

The GA-EPPC Election of Officers was held during the meeting with the new officers voted in unanimously. 2011 Officer Nominations were President – Brian Arnold, President Elect – Karan Rawlins, Secretary – Meghan Hedeon and Treasurer – Elaine Nash. We welcome Matthew Chappell with University of Georgia Horticulture Department as a new board member for 2011.

A big thank you to Cynthia Taylor for her dedication and hard work as GA-EPPC President and officer over the five years she served. Mincy Moffett is retiring as President elect, although he will remain on the board. He has been leading the initiative to revise the Non-native Invasive Plant List for GA-EPPC. Leaving the board are Gary Wade, Cynthia Taylor and Danielle Green due to retirement, relocation or job requirements. Thank you for all you have done to help raise public awareness and focus attention on the issue of invasive species and the harm they cause to landscapes and habitats across Georgia.

North Carolina EPPC Update

by Rick Iverson, President



Details are being finalized for NC EPPC's joint conference with the North Carolina Vegetation Management Association (NCVMA) on December 8 and 9 at the Sheraton Hotel Downtown in Raleigh, NC. This is the first time the two groups have joined for a conference. We are confident the meeting will provide valuable interaction amongst a diverse set of professionals charged with the management of nuisance vegetation. Of special interest to the NC EPPC participants will be a presentation by our graduate student scholarship winner, Megan Malone, on the impact of streamside restoration to exotic plant invasions. Other topics of interest will include updates on hydrilla (*Hydrilla verticillata*) and mile-a-minute vine (*Persicaria perfoliata*) in North Carolina, an update from the National Park Service SE Invasive Plant Management Team, a description of Maxent software to predict plant invasions, EDRR implementation in North Carolina and a discussion of a biofuels program in North Carolina. Pesticide certification credits will be offered for attendance at the meeting. Registration for the 2010 meeting and additional information about the NCVMA is available on the World Wide Web at www.NCVMA.net.

Thanks to the efforts of Margaret Fields, Invasive Species Coordinator with the North Carolina Chapter of The Nature Conservancy (TNC) and NC EPPC Board member, NC EPPC is pleased to announce the following members of our recently-formed Communications Committee:

- Colleen Bockhahn, Wake County Parks, eradicating weeds daily and telling folks about it;
- Catherine Bollinger, a freelance environmental writer in Chatham County and on the county environmental review board;
- Jim Burke, Natural Resources Extension Agent, Gaston County, has conducted invasive species training;
- John Withrow, Prevention Outreach Specialist for Coast Guard Auxiliary working with boating groups and aquatic nuisance species;
- Marika Godwin, trained folks in Giant Hogweed eradication in Nova Scotia (no small task), and currently living in Elizabeth City, NC; and,
- Melanie Doyle, Conservation Horticulturist with the NC Aquarium at Kure Beach and currently the coordinator for the NC Beach Vitex Task Force.

The committee is currently reviewing ideas for a plan, initially proposed by Debbie Crane of the North Carolina Chapter of TNC, including entry of NC EPPC to the social networking arena by way of Facebook.

EDRR workshops have been scheduled across the state of NC including one with a key group of environmental professionals in Raleigh, NC and one with professionals in the Sandhills Weed Management Area of North Carolina.

*Rick Iverson, Weed Specialist, NCDA&CS, Plant Industry Division,
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Tennessee Invasive Weed Awareness Week – 2011

by Margie Hunter, Secretary TN-EPPC

EPPCs are always looking for opportunities to bring their message to the general public. The Tennessee Exotic Pest Plant Council took a cue from Kentucky and decided to sponsor our first Invasive Weed Awareness Week back in 2009. We sought a State Proclamation from the governor and used that as a carrot to attract 47 like-minded conservation and gardening groups, and the media to cover the event. Our designated week coincided with National Invasive Weed Awareness Week (NIWAW) in Washington, DC (Feb. 22-28, 2009), and featured 12 invasive plant removal events statewide. A press packet of the proclamation, supporting organizations, and events was sent to dozens of media outlets across the state along with a description of TN-EPPC and its mission.

In 2010, we opted to keep TN-IWAW at the end of February (22-27) rather than move it to January with the renamed National Invasive Species Awareness Week (NISAW). We approached the Tennessee General Assembly, our state legislature, for a Joint Legislative Resolution in support of our second annual TN-IWAW. Our list of supporting organizations grew to 58, and we had 17 events statewide, including 14 invasive plant removal projects, including the removal of invading garlic mustard (*Alliaria petiolata*) from an area disturbed by a tornado



The volunteer crew at Radnor Lake State Natural Area who worked on privet, bush honeysuckle and tree of heaven.

in Stones River National Battlefield in Murfreesboro. Three public presentations were given on the issue of invasive plants. Once again, we blitzed the media with a press packet. Event photos and highlights are posted on our website.

Our Third Annual TN-IWAW is Feb. 21-26, 2011. We have contacted our list of supporters, encouraged them to plan an invasive plant removal event or community presentation, and requested that they send us the details for a press release and our online calendar. Thanks to the great momentum of our supporters, we are not seeking an accompanying proclamation or resolution. At this point, our responsibilities with TN-IWAW are straightforward and relatively simple to execute. We plan to continue each year in an effort to reach an ever greater segment of our populace with the message on invasive pest plants.

Please visit our new website and note the new Board of Directors for 2010: <http://www.tneppc.org/>

Phyllanthus fluitans Benth. (Euphorbiaceae) A Newly Reported Invasive Species In Florida

by George J. Wilder and Michael P. Sowinski

Herein, we present the first report of *Phyllanthus fluitans* growing wild in North America north of Mexico (Kartesz, in press; USDA, 2010). This fresh-water species native to South America is the sole free-floating aquatic of the large genus *Phyllanthus*. (*Phyllanthus leonardianus*, from Zaire, is also aquatic, but plants are rooted to the bottom; Cook, 1996). Common names of *P. fluitans* include red root floater and floating spurge (“Schwimmende Wolfsmilch”).¹ Here we consider the record of its discovery in our region, how the plant may have been introduced here, and control measures undertaken so far. We also describe the morphology and color of *P. fluitans*, because this species is not represented in floristic manuals for our region. We base our morphological description on personal field observations and on living specimens collected from nature on Oct. 1, 2010.

Record of Discovery

On Aug. 27, 2010, George Wilder found *P. fluitans* growing abundantly in a canal by the Peace River, in Desoto County, Florida (27°05'14.51"N, 81°59'33.77"W). On Sept. 7 and Sept. 10, 2010, Michael Sowinski observed the species at twenty additional locations within the Peace River and its tributaries. Included, was a major infestation within a narrow channel just north of the junction of the Peace River and Horse Creek (27°06'16.75"N, 81°59'04.59"W; Figures 1, 2). On and between Oct. 19 and Oct. 29, 2010, Michael Sowinski observed plants at fifteen more localities associated with the Peace River, the two most northern locales being situated north of Arcadia.

All known localities were from De Soto County and the two most separate ones were twenty-six river-miles apart. Richard Wunderlin of the University of South Florida (USF) and George Wilder have prepared herbarium specimens for the Herbarium of Southwestern Florida (at the Naples Botanical Garden), USF, and for distribution elsewhere.

Morphology and Color

Shoots of *P. fluitans* either float on the water surface or, where plants bunch together, they may also extend a short distance into the air (Figures 1-3). The stems are brittle, are approximately 1 to 1.5 mm in diameter, and range up to 130 mm long. All stems bear foliage leaves, contrary to the habit of most *Phyllanthus* species in Florida in which foliage leaves are confined to lateral branches (Wunderlin and Hansen, 2003). A vegetative bud and a cymule (small cyme) of imperfect flowers develop axillary to a foliage leaf. Some vegetative buds expand into branches, thus manifesting vegetative reproduction (Figure 3).

Clusters of adventitious roots arise from older stem portions and extend into the water. The roots of a cluster emerge primarily



Figure 1. *Phyllanthus fluitans* growing in a canal. Aggregates of this species appear light blue-green.

from a node and from the distal portion of the immediately subjacent internode.

The foliage leaves are distichously arranged, range from 9 to 17 mm long and are separated by internodes 5 to 20 mm long. Each leaf exhibits a lamina, a petiole less than 1 mm long, and two brown-transparent stipules. The lamina (the distal expanded portion of the leaf) is more-or-less orbicular, entire and unlobed marginally, cordate basally, and with a shallow notch distally. It exhibits two deep pockets – one on each side of the midrib (Figure 3). Lamina tissue that demarcates a pocket is concave on the bottom and protuberant on the top. Each pocket appears elliptical in top view, has a long axis parallel to the long axis of the lamina, and extends laterally from the lamina midrib nearly to the associated leaf margin. Superimposed upon individual pockets are obliquely oriented folds of the lamina (Figure 3). Whereas pockets and folds are protuberant, the lamina tissue defining them is neither thickened nor spongy. The lamina is water-repellant and both lamina surfaces are densely papillate.

We observed light blue-green foliage leaves (Figures 1, 2) and brown and pink roots. Cook (1996) described leaf color as green when young, becoming red at maturity. Wallach (2010) reported plants from the Bolivian Pantanal having glorious red color (“herrlich rote Farbe”). He also determined that cultivated plants vary in color, according to the intensity and duration of ambient light.

Cymules and flowers — Most cymules are three-flowered, but two or four flowers may occur. Each cymule exhibits at least one staminate flower and one pistillate flower.

We examined ten staminate flowers and ten pistillate flowers. All were short-pedicellate, radially symmetrical, and normally

¹ Wolfsmilch, literally translated as “Wolf’s milk”, is a German word for spurge.

exhibited three sepals and three petals (however, one staminate flower bore three sepals and four petals). Because sepals and petals are comparable in color, size, and shape they are called tepals. The tepals are white or greenish-white and are not fused together (Figure 3).

The staminate flowers vary from 2.5 to 3.5 mm in diameter. Centripetal to the tepals, each staminate flower typically exhibits a ring of six discrete sessile glands (however, one flower had seven glands). Generally, each gland lies along a separate radius defined by the facing margins of two adjacent tepals. The glands vary from green to red. Centrally, the flower exhibits three stamens, each composed of an anther and short filament. The stamens are mostly distinct, but in one flower two filaments were connate. Filaments are green and the anthers vary from yellow to red.

The pistillate flowers range from 2 to 2.7 mm in diameter. Centripetal to the tepals, each pistillate flower manifests one low, circular, continuous or slightly interrupted disc. Discs vary from green to red. Centrally within the flower and subtended by the disc is a green-to-pink superior ovary culminating in six short styles with terminal stigmas. The styles vary from green to reddish and the stigmas are red.

The fruit, a capsule, is subtended by persistent tepals. It is depressed-globose and 3 mm wide. The capsule is trilocular and six-seeded, with two seeds filling each locule. The seeds, which outwardly resemble orange segments, exhibit numerous minute, dark-brown, superficial processes over a light brown background.

Manner of Introduction and Control Measures

Numerous articles online reveal that *Phyllanthus fluitans* is a popular aquarium plant. Thus, we suspect that the species was introduced here via the aquarium trade.

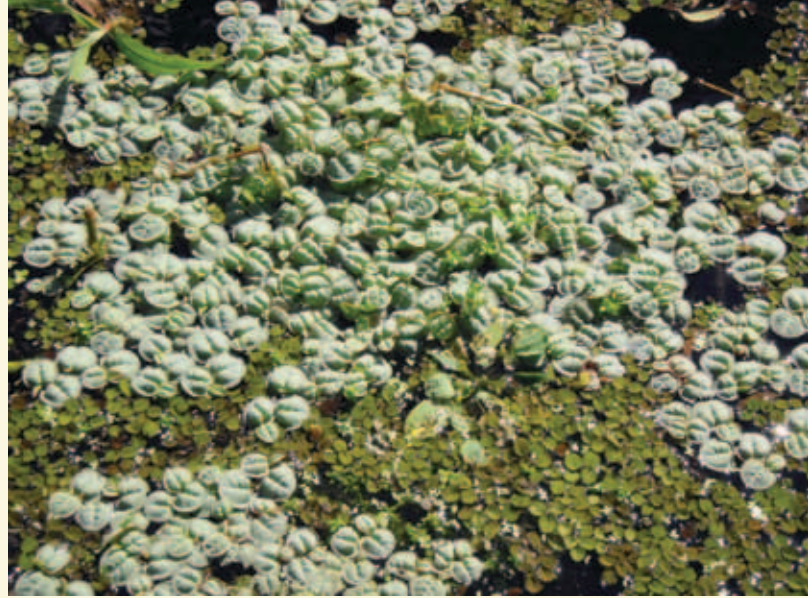
During Oct. 4-6, 2010, Mr. Ronnie Crosby of the Southwest Florida Water Management District sprayed certain infested localities with the herbicide Knockout™ (active ingredient = diquat dibromide). Treatment killed some but not all plants. Future treatments are envisioned. We fear that if treatments fail this aggressive species could become as problematical in Florida as are *Pistia stratiotes*, *Eichhornia crassipes*, and *Salvinia minima* (Langeland et al., 2008).

Acknowledgements

The authors acknowledge the assistance of Mr. Keith A. Bradley, Dr. John T. Kartesz, Mr. Brian Nelson, Ms. Barbara J. Roche, Ms. Brenda Thomas, Ms. Eileen Watkins, Dr. Richard P. Wunderlin, the Invasive Plant Management Section of the Florida Fish and Wildlife Conservation Commission, the Southwest Florida Water Management District, and the Naples Botanical Garden.

About the Authors

George Wilder is Botanist and Herbarium Curator at the Naples Botanical Garden, Naples, FL. He is a retired Professor of Biology from Cleveland State University (Cleveland, OH) who



MICHAEL SOWINSKI



KELLE SULLIVAN, FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

▲ Figure 2. A clump of *Phyllanthus fluitans*.

◄ Figure 3. A portion of the shoot system of *Phyllanthus fluitans*.

has conducted research in plant anatomy, plant morphology, and floristic botany. Michael Sowinski serves as Biological Scientist III for the Florida Fish and Wildlife Conservation Commission.

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- George Wilder, Naples Botanical Garden, Naples, FL, 239/643-7275 ext. 1911; gwilder@naplesgarden.org; Michael Sowinski, Florida Fish and Wildlife Conservation Commission – Invasive Plant Management Section, Bartow, FL, 863/534-7074; michael.sowinski@myfwc.com

More on *Phyllanthus*

by Colette Jacono

In this issue, George Wilder and Michael Sowinski present *Phyllanthus fluitans* as a recent addition to Florida's aquatic environment. While beautiful in structure and unique in adaptations, we cannot expect this "one more" introduced species to be celebrated by land managers already stretched to the limit in working resources. Yet, let's step back from these practical implications and take the opportunity to further explore that which our authors have so well introduced — the interesting botanical features of the genus *Phyllanthus*. We can do this by examining two terrestrial, weedy species that also are introduced and very common to observe in late summer through fall throughout the state, *Phyllanthus urinaria* (chamber bitter) and *P. tenellus* (the Mascarene Island leafflower).

Both *Phyllanthus urinaria* and *P. tenellus* germinate each summer from seeds established in the soil. Homeowners typically notice seedlings in gaps within St. Augustine grass as the lawn begins to decline from the rigors of summer climate and with the onset of shorter days. By referencing the key to species in the genus *Phyllanthus* offered in Dick Wunderlin's Guide to the Vascular Plants of Florida, we will quickly recognize these two terrestrial species from the aquatic *P. fluitans* by the absence of leaves on the main stem. The terrestrial species instead have a naked stem that extends straight upright, and distinctly horizontal branches from which the simple, individual leaves are held in alternate arrangement from each other. From above, as these small, herbaceous plants are usually viewed, the horizontal, leaf holding branches are often mistaken as compound leaves, perhaps of a species in the pea family (Fig. A and C). Closing in with a hand lens on the lower part of the branches will reveal, however, each entire leaf, a flower, and soon after, a tiny capsule all emerging from a subtending node (Fig. B and D). From this close vantage point is where *P. urinaria* may be distinguished from its relative, *P. tenellus*, as the capsules of the former are closely attached to the branch (Fig B.), while the latter has stalks that hold the flowers and capsules away from the branch (Fig D.). The capsules of both of these species can produce six seeds each, which serve as the source for next year's plants. Offer a gap or disturbance for their regeneration and off we go into the life cycle of an annual, weedy, introduced plant.

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Figure A. *Phyllanthus urinaria*



Fig B. *Phyllanthus urinaria*



Fig C. *Phyllanthus tenellus*

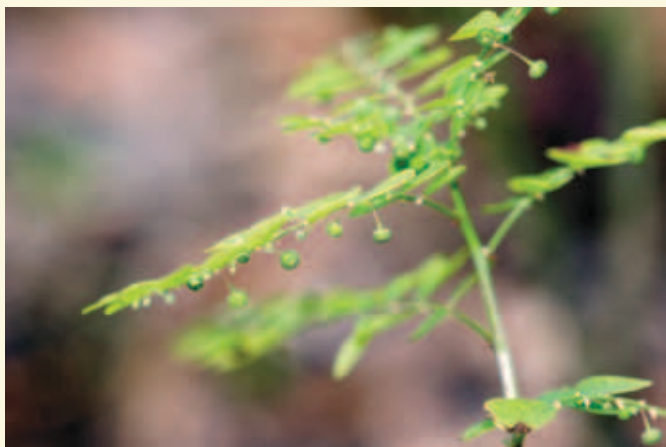


Fig. D. *Phyllanthus tenellus*

Flagler Beach Residents Prepared to Fight Back

by Terri Newmans and Lauren Swanson • photos by Terri Newmans

A group of Flagler Beach residents is now prepared to fight local exotic plant invaders thanks to FLEPPC's Kathy Craddock Burks Education and Outreach Grant, awarded to Gamble Rogers Memorial State Recreation Area (GRMSRA) at Flagler Beach in 2009. State park staff, along with experts from the Florida Department of Environmental Protection, Florida Sea Grant and the University of Florida, conducted two five-hour workshops that highlighted the effects that invasive exotic plants have on Florida's ecosystems.

In fall 2009, Flagler and Volusia County residents joined *The Great Invaders: Invasive and Non Native Plant Workshops* to discover how some plants, while beautiful, can have a devastating effect on Florida's ecosystems. In order to attract residents, GRMSRA staff sent press releases to local media outlets, advertised on the park website, distributed flyers within the park and at local businesses, and notified staff of organizations with similar interests.

Workshop participants learned how to identify the area's most common invasive plants and remove these invaders from their property. Participants discovered native plant alternatives that are beneficial to the environment and equally as attractive as their invasive exotic counterparts. The two five-hour workshops had a total of approximately thirty attendees, and materials were sent out to additional residents who were unable to attend the workshops but who volunteered at one or more of the three exotic plant removal workdays scheduled following the workshops.

Dr. Maia McGuire of the Florida Sea Grant Extension Office began the workshop with a presentation on the impacts of invasive exotic plants and how to identify these species. Using real samples of the workshop's target plants, Brazilian pepper (*Schinus terebinthifolius*), Chinese tallow (*Sapium sebiferum*), cathedral bells (*Kalanchoe pinnata*), Britton's wild petunia (*Ruellia simplex*, also known as *R. brittoniana*), asparagus-fern (*Asparagus setaceus*), creeping oxeye (*Sphagneticola trilobata*, also known as *Wedelia trilobata*), castor-

bean (*Ricinus communis*) and air potato (*Dioscorea bulbifera*), participants were provided with hands-on exposure to these nuisance plants. Identification materials also were provided to help homeowners identify targeted plants upon returning home.

Mark Warren from the UF/IFAS Flagler County Extension Office followed Dr. McGuire's presentation with an overview of the proper control methods available to homeowners. Mr. Warren demonstrated several methods including cut surface, foliar, and basal bark herbicide applications.

Terri Newmans, Park Services Specialist, explained the *Volunteer Exotic Control Program* that was created to track the effectiveness of these workshops. Participants were provided with five post-card-sized reporting forms that could be mailed to the park after they removed invasive exotic plants from their land or from their communities. In addition, participants were invited to participate in three invasive exotic plant removal workdays to be held at GRMSRA and North Peninsula State Park. Half of the workshop attendees signed up to participate in the workdays, and many additional volunteers assisted with the projects throughout the year.

The final portion of the workshop addressed native plant alternatives. Alice Bard, Environmental Specialist II with the Florida Park Service, provided participants with an extensive list of native plants that are not only beautiful, but environmentally friendly. She was assisted by Southern Horticulture, a nursery in St. Augustine, Florida that provided approximately 35 native plant samples, including groundcovers, shrubs, perennials and trees. These plants built a critical connection between the workshop participants and local native plant providers. It also allowed participants to see and enjoy the recommended native plant alternatives.

To promote the FLEPPC mission, the logo was displayed on flyers and workbooks, and the name was mentioned in press releases and radio station announce-



Attendees not only learned to identify invasive exotic species, but also learned about the importance of using native plants when landscaping.



Dr. Maia McGuire instructs workshop participants on the impacts of invasive exotic plants in Florida's ecosystems.

ments. FLEPPC also was named in a Flagler Palm Coast News Tribune article written by a reporter who was on site to cover the workshop.

The workshops were a great success and have instilled in participants a new sense of awareness about plants that pose a threat to the biodiversity of our beautiful Florida ecosystems. The park staff hopes to continue working with the community to utilize this exciting new program to battle Florida exotic plant invaders.

Terri Newmans, Park Services Specialist, Ft. Mose State Park; Lauren Swanson, Park Services Specialist, Gamble Rogers Memorial State Recreation Area at Flagler Beach, Lauren.Swanson@dep.state.fl.us



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Calendar

Southern Weed Science Society - Weed Management in Aquatics. Annual meeting, January 24-26, 2011, San Juan, Puerto Rico. www.swss.ws

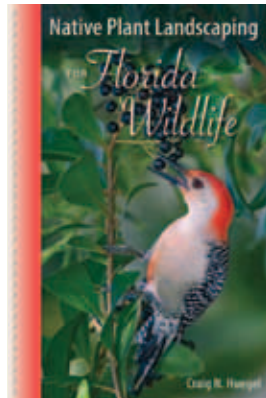
National Invasive Species Awareness Week 2011, Feb. 28-March 4, 2011, Washington, DC. <http://www.nisaw.org/> A week of activities, briefings, and events to highlight activities across the nation and around the world to stop and slow the spread of invasive species. See ad on page 4.

Joint Meeting of the Kentucky Invasive Species Working Group and the Southeast Exotic Pest Plant Council – May 3-5 2011, Lexington, KY. See ad on page 11.

Joint Meeting of the Florida Exotic Pest Plant Council and the Florida Native Plant Society, May 17-20, 2011, Maitland, FL. *Exotics on the Run – Leveling the Playing Field for Native Species.* www.fleppc.org or www.fnps.org

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by Craig N. Huegel

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- *Cold weather and the potential range of invasive Burmese pythons*, by Avery, M.L., Engeman, R.M., Keacher, K.L., Humphrey, J.S., Bruce, W.E., Mathies, T.C., and Mauldin, R.E. *Biological Invasions* 12 (11): 3649-3652, DOI: 10.1007/s10530-010-9761-4. Good news – they can't take the cold!
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against the discounted stream of the costs of control and social damages that are avoided by using SPS measures, where future growth of any established infestation is accounted for." Research funded by the U.S. Department of Agriculture's Program of Research on the Economics of Invasive Species Management (PREISM).

Book Review

H. Mooney, M. Williamson, and C. Perrings: **Bioinvasion and globalization.** Oxford University Press, Oxford, 2010. 288 pp, US\$65.00 paperback, US\$140.00 hardback, ISBN 10 0199560161. Review by Lockwood, J.L. *Biological Invasions* 12 (11):3905-3906, DOI: 10.1007/s10530-010-9765-0.

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