

Under the radar?

Ficaria verna quietly naturalizing in the Southeast

By Jane K. Marlow, Jeffery L. Beacham, and William C. Stringer

Photos by Jane K. Marlow at Lake Conestee Nature Park in Greenville, SC, unless indicated otherwise

Fig buttercup is not well-known in the Southeast. More accurately, most people have never even heard of it.

A few minutes on the internet reveals that fig buttercup — aka lesser celandine (*Ficaria verna*, formerly *Ranunculus ficaria*) is a perennial with origins in Europe and northern Africa; that it has been cultivated in the US for over 150 years; that Wordsworth wrote poems praising it; that it is available in the nursery trade; and that it is reported to be invasive in ten states and the District of Columbia, and is on the noxious weed list in Connecticut and Massachusetts.

In April 2013 it was discovered in Greenville County, SC. After having met the plant, we feel that it is vital to make the Southeast's invasive plants community aware that it is HERE (not just in the Northeast), and that it poses a very serious threat.

An article documenting its discovery in Asheville, NC, in 2011 first brought the plant to our attention:

“Fig buttercup is a vigorously growing herbaceous plant that completes its growth cycle during winter and spring.... Its emergence before most native species gives it a great competitive advantage. Once established, it spreads rapidly, forming a solid green blanket... which native plants are unable to penetrate.... The plant makes numerous tubers and bulblets, each of which can grow into a new plant once separated from the parent plant. These are spread by animals, well-meaning human weed pullers and water events. Because of its short growth cycle [Dec.-May] there is a limited window of opportunity for controlling it....” (Cote 2011).

Two years later we would have the opportunity to see it for ourselves, when a birder spotted a patch of unfamiliar bright yellow flowers in Lake Conestee Nature Park, and, on April 4, 2013, was curious enough to ask about them.

Most North American floristic treatments have not emphasized sub-specific differences, but a recent review of herbarium collections has confirmed that all five currently recognized subspecies are present in the United States (Post et al. 2009). The one we found is *Ficaria verna* subsp. *verna* (Weakley 2012).



Once established, *Ficaria verna* forms a solid green blanket which excludes all other vegetation.



Fig buttercup's flowers are yellow with a slightly darker center, typically with 8 petals.

On April 9th, the newly discovered plants were in full bloom. Flowers are a buttery yellow with a slightly darker center, typically with 8 petals but sometimes more (Swearingen 2010).

The Plant Conservation Alliance states, “When in full bloom, large infestations of lesser celandine appear as a green carpet with yellow dots, spread across the forest floor” (Swearingen 2010). These mono-cultural “carpets” may cover several acres. By way of comparison, ours were “scatter rugs” — some loosely strung together in furrows channeled by the adjacent Reedy River. The Reedy flows



Top: Roots produce abundant fingerlike or fig-shaped tubers.
Bottom: Subspecies *ficariiformis* and *verna* are capable of producing axillary bulbils. Both bulbils and tubers, if separated from the parent plant, can grow into a new plant.

through the city of Greenville, spilling over its banks with some regularity. Lake Conestee Nature Park straddles this river, and we found *Ficaria* scattered throughout 1.5 miles of its floodplain.

Mesic Environment

Ficaria verna thrives in mesic environments on the banks of rivers, streams, lakes, and ponds, as well as in wetlands, and it is most commonly found in (but not limited to) sites adjacent to a water source. In Birmingham, AL, it was found adjacent to a seasonal stream (EDDMapS 2013), and in Chattanooga, TN, at the confluence of the Tennessee River and a local creek (Collins & Shaw 2009). In Wake County, NC, *Ficaria* propagules from a shaded lawn became established along a drainage ditch, then were dispersed through a culvert to colonize downstream banks of a local waterway (Post et al. 2009, Axtell et al. 2010). A similar scenario played out in Buncombe County, NC, where a creek provided the migration path from landscape plantings to the University of North Carolina at Asheville

Greenway, then into the Botanical Gardens at Asheville (Cote 2011, Kranzyk 2013).

Fig buttercup is likely to be found in the preferred habitat of many native spring ephemerals, growing in dense patches. We quickly learned to spot these patches, even from a distance, even without flowers.

Isolated clumps required more inspection. Plants consist of a basal rosette; the leaves are petiolate, kidney-to heart-shaped, a dark shiny green, and succulent (Swearingen 2010). To our inquisitive fingers the fleshy leaves felt almost rubbery; the netted venation on leaf undersides looked almost reptilian.

Multiple Reproductive Mechanisms

The roots produce abundant finger-like or fig-shaped tubers, and two of the five subspecies are capable of producing axillary bulbils late in the flowering season. When separated from the parent plant, both bulbils and tubers can produce new plants. Some of the literature states that lesser celandine's achenes are usually abortive, but that's true for only one of the subspecies; in the other four, seeds are apparently viable (Post et al. 2009, Axtell et al. 2010).

Accelerated Growth Cycle

By April 15th, we were hard-pressed to find any flowers, which brought home the fact of the plant's accelerated growth cycle. It emerges in winter (ahead of most natives), flowers in March-April, then immediately begins to die back. Above-ground portions are mostly gone by June (Swearingen 2010), but axillary bulbils may still be visible.

Its ephemeral nature creates a very short window during which it can be treated. Small populations can be dug up manually (if care is taken to remove, bag, and properly dispose of every bulblet and tuber), but physical removal creates ground disturbance, which in turn encourages further infestations.

Swearingen (2010) recommends application of a 1-1.5% concentration of a 53.8% active ingredient glyphosate isopropylamine salt (e.g. Rodeo® labeled for use in wetland areas), mixed with water and a non-ionic surfactant, to be applied prior to flowering and up until about 50% of the plants are in flower. After that, she says, control success declines and the possibility of harming native am-

phibians and/or plants increases. Hammerschlag et al. (2003) recommends treating two years sequentially with a 1.5% concentration of Rodeo, then perhaps skipping a year or doing subsequent spot treatments. Other options have been suggested; additional replicated field research is needed.

On May 1, the leaves of much of the *Ficaria* were already yellow. AquaMaster® (a product equivalent to Rodeo) was applied to plants still possessing green leaves. The new year will reveal the results of these efforts and also, perhaps, offer an opportunity to field test other options.

On June 12th we revisited an untreated site. The dense green blanket of vegetation had vanished, leaving only bulbets on the soil surface. Adjacent knee-high vegetation had not begun to colonize the bare ground.

The Tipping Point

North of the Southeast Exotic Pest Plant Council region, *Ficaria* is certainly behaving like an invasive, but it is not currently listed as invasive by any southeastern state. Each state attempts, individually, to make a fair assessment of a plant's invasive potential in their region. For instance, in some states — to even be considered — a plant must either be listed federally, pose a severe threat in a neighboring state, or be documented in multiple counties within the state. This measured response is partly dependent on timely, accurate range map data.

In December 2013, the USDA PLANTS database site reported 22 states with documented populations of *Ficaria*. Not included were North Carolina (Krings, et al. 2005), Maine (University of Maine 2008), Alabama (EDDMapS 2013) and South Carolina (Clemson University 2013). The USDA PLANTS database welcomes “thorough, verifiable plant distribution information from the public,” but apparently these records have not made their way into the database.

What about the Early Detection & Distribution Mapping System (EDDMapS.org)? EDDMapS is capable of real-time tracking of invasive species occurrences, but it relies on people in the field knowing what is significant and taking time to report it. There are multiple tools available to report occurrences. In December 2013, EDDMapS.org showed only five southeastern counties with infestations, a surprisingly reassuring picture. Was it accurate? We don't think so. Again, species occurrences are not being reported enough to provide up-to-date distribution maps.

Studies suggest that *Ficaria* may have transitioned out of the lag phase of population growth and into the rapid expansion phase (Post et al. 2009). About it, Weakley (2013) says, “This seems to be a plant that is seriously ‘on the move’. It is

Apparently there is widespread confusion

concerning fig buttercup and marsh marigold (*Caltha palustris*), but it is important that land managers be able to distinguish between them. Marsh marigold is native to wetlands in the eastern US (rare in some parts of its range) and is not known to exhibit invasive tendencies (reports to the contrary are most likely based on mis-identification).



Photo by Timothy P. Spira

They both bear bright yellow flowers surrounded by deep green, somewhat heart-shaped leaves. They differ in that:

- roots of fig buttercup will have numerous fig-shaped tubers; those of marsh marigold will be short, stout and fleshy.
- vegetative growth of fig buttercup may take the form of extensive, continuous mats in wetlands and along waterways; that of marsh marigold will not.
- flowers of fig buttercup have 3 (rarely 4) sepals and from 6 to 26 (usually 8) yellow petals (some double-petalled varieties have more); flowers of marsh marigold are composed of 5-9 yellow sepals (no petals).
- two subspecies of fig buttercup are capable of producing bulbils in their leaf axils; marsh marigold is not.

(Axtell et al. 2010, Post et al. 2009, Swearingen 2010, Weakley 2013)

one of those somewhat mysterious plants that seems to have been cultivated (at least in a minor way) in North America for hundreds of years but only recently has become aggressive. Recently, it has been popping up everywhere....”

With regard to this plant, we suggest that the Southeast is close to a tipping point. We feel that we're already there, but there are those who would like more evidence.

If you've read this far, you should have a fair idea of what fig buttercup/lesser celandine looks like, where and when you might expect to see it, and what it can do to a natural ecosystem. To augment what you've read here, you can search the web or read the literature cited herein. Share your knowledge with colleagues, clients, and staff.

Look for it. Take time early this spring to scout likely sites. If you find an infestation,

document it! Record the date and exact location, send specimens to regional herbaria, and post it on EDDMapS. You may also provide this information to the USDA Plants database (for instructions, see <http://plants.usda.gov/du/DistributionUpdate.html>).

Encourage your state EPPC or Invasive Plant Council board to list the plant, and urge your state Department of Agriculture to prohibit sale of the plant in your state. We have a chance to stop this one, but we will need to increase the public awareness of this emerging invasive plant problem.

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We have a chance to stop this one,

but we need to increase awareness of this emerging invasive plant problem and report sightings for accurate distribution maps. The Early Detection & Distribution Mapping System (EDDMapS) is a mapping tool used to document the distribution of invasive species across the United States and to help identify leading edges of new infestations. EDDMapS relies on reports from the field to keep their maps current. The two ways to report invasive plant occurrences are at EDDMapS.org using a web-based data entry form, or by using the Southeast Early Detection Network (SEEDN) app available for smartphones at apps.bugwood.org/seedn. Karan Rawlins of EDDMapS says, "To me, the absolute easiest is with a smartphone using the SEEDN app." The app enables you to submit invasive species observations directly with your smartphone from the field. These reports are uploaded to EDDMapS and e-mailed directly to local and state verifiers for review. Good photos for identification purposes are essential.

Learn more about collecting and reporting data using the EDDMapS Handbook available online at www.eddmaps.org/training/EDDmapS.pdf