

Lesser Celandine (*Ficaria verna**) in Wisconsin: history and control efforts

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*(syn. *Ranunculus ficaria*)



Origins and features of lesser celandine (aka, fig buttercup, pilewort)

- **Native Range:** central Europe, North Africa and western Asia.
- **Native ecosystems:** seasonally wet or flooded, especially sandy soils in both shaded woodlands and open areas. Often associated with oaks.
- **Introduced Range:** Australia, New Zealand, Japan, Europe, Canada and U. S.
- **Non-native ecosystems:** (un)disturbed moist deciduous forest, lawns, horticultural plantings, drainage and riparian zones.

Spread in U. S.

- First reported in 1867 from Pennsylvania.
- Probably introduced as an ornamental.
- Now found in 26 of states (principally NE ¼ of U. S. and Pacific NW).
- 79% of U. S. suitable for establishment*.
- 95+% of Upper Midwest suitable for establishment*.
- Listed as banned, prohibited or noxious weed in a few states, but still sold (rarely) as ornamental despite USDA classification as “High Risk*”.

*USDA Weed Risk Assessment for *Ficaria verna* Huds. (Ranunculaceae)-Fig buttercup (2105).

Life cycle of lesser celandine

- Spring ephemeral that flowers early (April) then dies back by June until it re-emerges from **underground tubers** (left) and **bulbils** (below) the next year.



- During growing season forms **bulbils** (right) that drop and spread by water, gravity and wildlife.



Reproductive biology lesser celandine

The *bulbifera* form(s) found in Wisconsin

Subspecies	<i>bulbifera, ficariiformis, chrysocephalus</i>	<i>ficaria, calthifolius</i>
Pollen	Mostly non-viable	viable
Ave. no. seeds/plant	2	73
Bulbils produced	Yes, ≤ 24	No
Ploidy	Tetraploid	Diploid
Growth form	Spreading	Rather erect

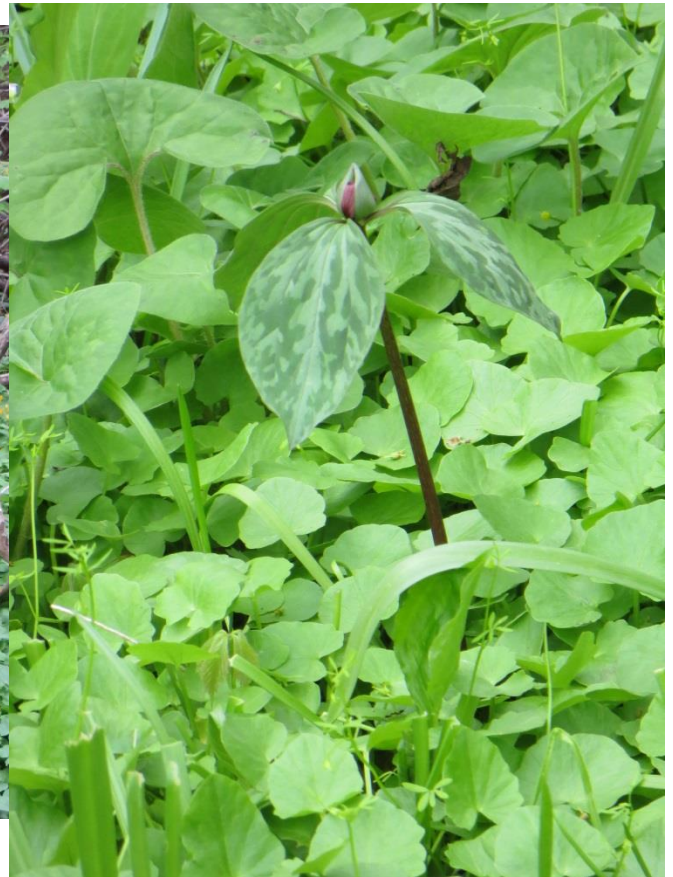
Axtell, et al. (2010). *Invasive Plant Science and Management* 3:190-196.

Chemical properties

- **Toxicity:** damaged leaves cause rash and blistering to skin and mucosa. Ingestion causes nausea, vomiting, dizziness, spasms or paralysis. Death reports in livestock. But, eaten by Chukar Partridge in Iran. Reported medicinal use to treat hemorrhoids (piles).
- **Alleopathy:** Lab and field experiments demonstrate alleopathic impacts on agricultural crops (**reduced or delayed germination**), native woodland forbs (**shortened lifespan, decreased seed production**); no impacts on a woodland grass.

Ecological Impacts

- Forms dense monospecific stands where introduced.
- Excludes or reduces native and non-native plant populations.

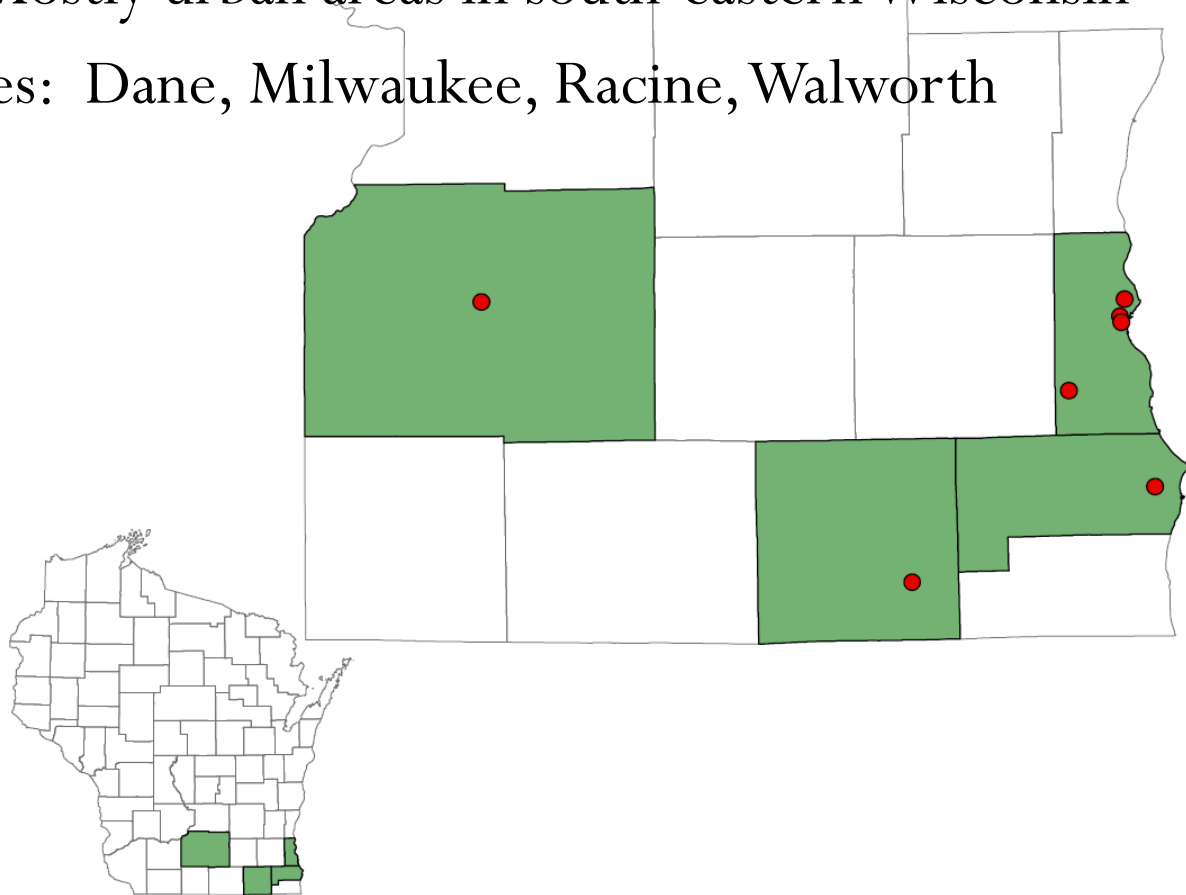


Control Options

- **Prevention**
 1. Outreach and education.
 2. Legal strictures.
- **Mechanical**
 1. Repeated cutting over multiple years.
 2. Digging, remove and destroy all tubers; highly disruptive in natural areas.
- **Chemical**
 1. Late winter/early spring application with glyphosate and surfactant best results so far. Treat before flowering to prevent bulbil formation. Extensive populations not yet eradicated.
- **Bio-control**
 1. None currently available.
 2. Ephemeral growth and many native Ranunculaceae – poor prospects?

Arrival in Wisconsin

- When? Within the past 20 years
- Where? Mostly urban areas in south-eastern Wisconsin
- 4 Counties: Dane, Milwaukee, Racine, Walworth



Locations of lesser celandine

- **Dane Co.:** UW-Madison Lakeshore Preserve and nearby University Heights.
- **Milwaukee Co.:** Milwaukee, WI: 1. Milwaukee River; 2. Lake Park; 3. along Kinnikinnic River; and along Root River (Wehr Nature Center).
- **Racine Co.:** Racine: Colonial Park.
- **Walworth Co.:** at least 2 private properties in Lake Geneva.

NR 40: Wisconsin's Invasive Species Law

- Two categories of invasive species
- 1. **Restricted**: established, not illegal to have on your land. Example: garlic mustard.
- 2. **Prohibited**: not yet in WI or incipient populations only, illegal to possess. **Control required**. Example: kudzu.
- Lesser celandine is a **Prohibited** species.

Control efforts in Dane County

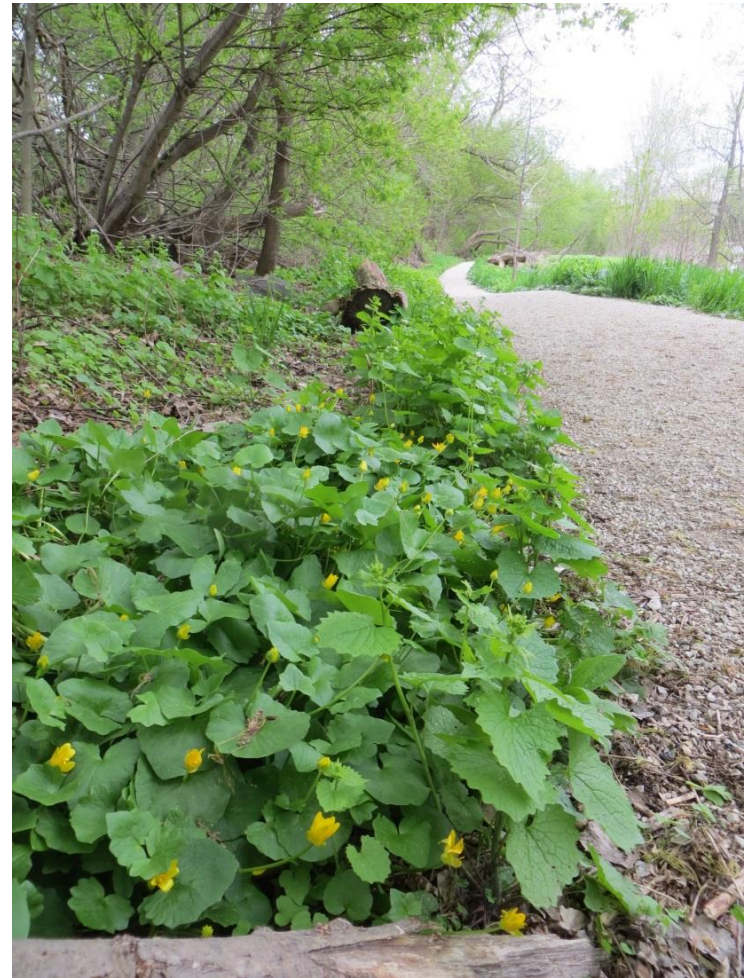
- Found in UW-Madison Lakeshore Preserve and nearby University Heights in 2013.
- All upland locations.
- Hand-pulling in 2013 – 2014.
- Comparison between glyphosate and triclopyr, both at 2.5% in 2015-2016.
- Killed above ground growth but impacts on tubers and bulbils not investigated.

Control efforts in Milwaukee Co.

- History of efforts at Wehr Nature Center, Franklin, WI by Mark Verhagen. Found in 2011.
- Treated dense areas with 5% glyphosate in 2011-2014 before flowering.
- Results are mixed. Dense areas contained and somewhat reduced.
- 2015-2016. Control of satellite populations near lake and stream to Root River.



2016 control efforts along Milwaukee River.



Milwaukee River (continued)



Milwaukee River (continued)

- **First treatment:** 22 April 2016. Aquaneat (a.i. glyphosate) at 2 oz./gallon with surfactant at 1 oz./gallon of water. 40-55 degrees F.
- **Results:** minimal die-back.
Bulbils likely already forming.



- **Second treatment:** 3 May 2016. Aquaneat at 4 oz./gallon with surfactant at 1 oz./gallon of water. 40-68 degrees F.
- **Results:** 90-95% die-back. Applicator attributed better results to warmer temperatures, more growth exposed to herbicide.

City of Milwaukee Parks

- Parks Dept. has been treating populations along Kinnikinnic River and at Lake Park with herbicides for several years.
- Results unknown.
- An ongoing effort.

Racine County

- April 2016, first patch (30 x 30 feet) found as well as several smaller patches in intermittently wet areas.
- No treatment so far.
- An ongoing effort.

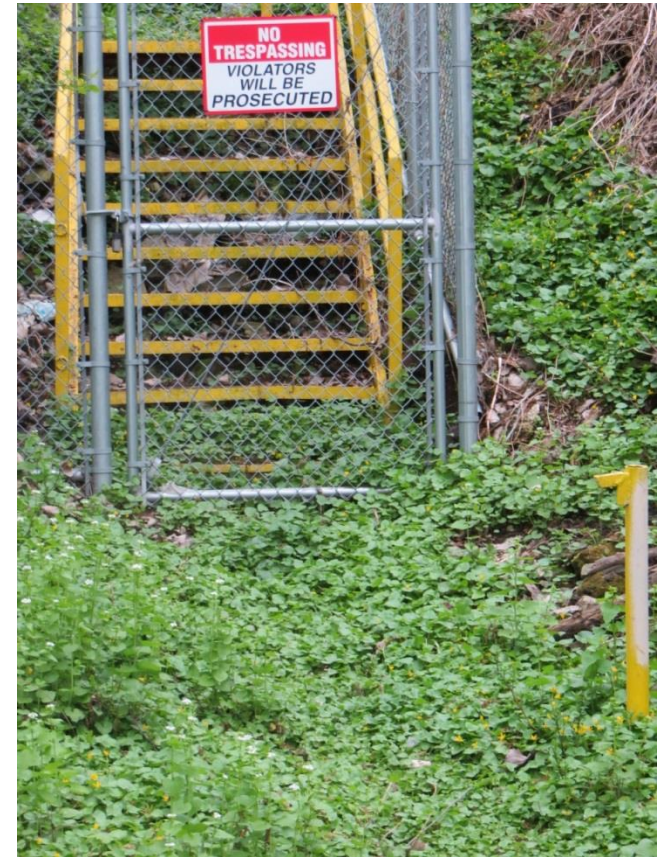
Reconnaissance of Walworth Co.

- In April 2016, visited the 3 sites documented as herbarium specimens a decade ago. No treatments.
- Found at 2 locations in Lake Geneva, each several acres. Roadside survey, so full extent unknown.



Future Efforts

- **Dane County**
 - Continue control work.
 - **Milwaukee County – all sites**
 - Evaluate 2016 control work.
 - Continue control work.
 - Inventory the river systems.
 - **Racine County**
 - Begin control work in 2017.
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- All control projects are expected to last several years.



Future Efforts – Walworth Co.

- **Lake Geneva**
- Find and contact landowners.
- NR 40 outreach and need for control.
- Begin control work?



What's your experience?

- We want to hear from anyone with experience controlling lesser celandine!

Questions?

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