

INDIANA

NON-NATIVE PLANT INVASIVENESS RANKING FORM

ASSESSMENT FOR INVASIVE PLANTS NOT IN TRADE
 Form originally created for use in New York
 Indiana Form version date: November 1, 2010

| | | |
|----------------------|-------------------------------------|--------------------------------|
| Scientific name: | <u><i>Glechoma hederacea</i></u> | USDA Plants Code: <u>GLHE2</u> |
| Common names: | <u>Creeping Charlie, Ground Ivy</u> | |
| Native distribution: | <u>Europe and Asia</u> | |
| Date assessed: | <u>7-23-2013</u> | |
| Assessors: | <u>Zach Deitch, Ellen Jacquart</u> | |
| Reviewers: | <u>Scott Namestnik, Stuart Orr</u> | |
| Date Approved: | <u>8-20-2013</u> | |

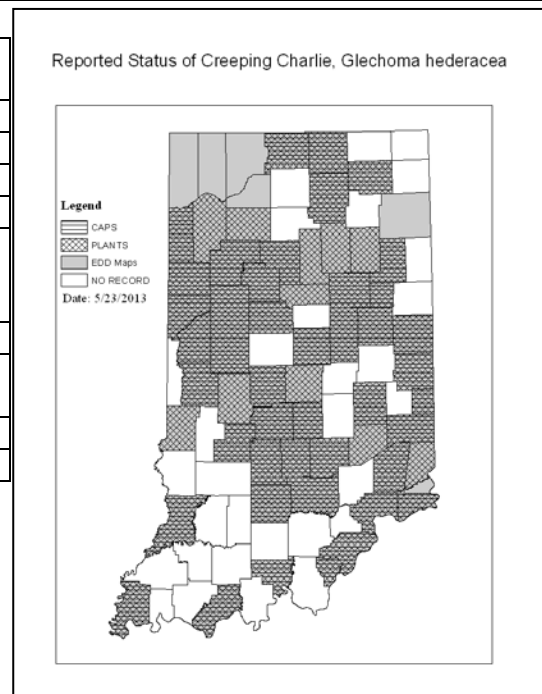
Indiana Invasiveness Rank: Moderate (Relative Maximum Score 50.00-69.99)

| Invasiveness Ranking Summary (see details under appropriate sub-section) | | Total (Total Answered*) Possible | Total |
|---|---|-------------------------------------|-----------------|
| 1 | Ecological impact | 40 (30) | 9 |
| 2 | Biological characteristic and dispersal ability | 25 (25) | 18 |
| 3 | Ecological amplitude and distribution | 25 (25) | 19 |
| 4 | Difficulty of control | 10 (7) | 6 |
| | Outcome score | 100 (87) ^b | 52 ^a |
| | Relative maximum score [†] | | 59.8 |
| | Indiana Invasiveness Rank [§] | Moderate | |

* For questions answered “unknown” do not include point value in “Total Answered Points Possible.” If “Total Answered Points Possible” is less than 70.00 points, then the overall invasive rank should be listed as “Unknown.”
[†]Calculated as 100(a/b) to two decimal places.
[§]Very High >80.00; High 70.00–80.00; Moderate 50.00–69.99; Low 40.00–49.99; Insignificant <40.00

A. DISTRIBUTION (KNOWN/POTENTIAL):

| | |
|---|--|
| A1 Has this species been documented to persist without cultivation in IN? (reliable source; voucher not required) | |
| <input checked="" type="checkbox"/> | Yes – continue to A2.2 |
| <input type="checkbox"/> | No – continue to A2.1 |
| | |
| A2 What is the likelihood that this species will occur and persist outside of cultivation given the climate in Indiana? (obtain from occurrence data in other states with similar climates) | |
| <input checked="" type="checkbox"/> | Likely – continue to A3 |
| <input type="checkbox"/> | Not likely – stop here. There is no need to assess the species |
| | |
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Sources of information: Range maps compiled from PLANTS database, <http://plants.usda.gov/java/>; Indiana CAPS database, <http://extension.entm.purdue.edu/CAPS/index.html>; Indiana IPSAWG reports (unpublished); and EDDMapS reports, <http://eddmass.org/>

A3 Describe the potential or known suitable habitats within Indiana (underlined). Natural habitats include all habitats not under active human management. Managed habitats are indicated with an asterisk.

| Aquatic Habitats | Wetland Habitats | Upland Habitats |
|--------------------------|-----------------------------------|---------------------------|
| Rivers/streams | Marshes | <u>Forest</u> |
| Natural lakes and ponds | Fens | Savannas |
| Reservoirs/impoundments* | Bogs | Barrens |
| | Shrub swamps | Prairies |
| | <u>Forested wetlands/riparian</u> | <u>Cultivated*</u> |
| | Beaches/dunes | <u>Old Fields*</u> |
| | <u>Ditches*</u> | <u>Roadsides*</u> |

Other potential or known suitable habitats within Indiana: Damp waste ground, hedgerows, and woodland margins.

Documentation: *It is a common ground cover plant in grasslands, wooded, areas or wasteland. It also thrives in lawns, shady edges, around buildings, floodplains, low woods and disturbed sites.*

Sources of information:

Pierce, 2012.
 Virginia Cooperative Extension, 2013.
 Plants For A Future, 2012.
 Plant Invaders of Mid-Atlantic Natural Areas, 2010.

B. INVASIVENESS RANKING

Questions apply to areas similar in climate and habitats to Indiana unless specified otherwise.

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes and System-Wide Parameters (e.g. fire regime, geomorphological changes (erosion, sedimentation rates), hydrologic regime, nutrient and mineral dynamics, light availability, salinity, pH)

- A. No perceivable impact on ecosystem processes based on research studies, or the absence of impact information if a species is widespread (>10 occurrences in minimally managed areas), has been well-studied (>10 reports/publications), and has been present in the northeast for >100 years. 0
- B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) 3
- C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl) 7
- D. Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology and/or hydrology, affects fire frequency, alters soil pH, or fixes substantial levels of nitrogen in the soil making soil unlikely to support certain native plants or more likely to favor non-native species) 10
- U. Unknown

Score U

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Documentation:

Identify ecosystem processes impacted (or if applicable, justify choosing answer A in the absence of impact information)

Although ground-ivy is found throughout much of North America, no specific information was available regarding its impacts on native plant communities and ecological processes across this range. However, ground-ivy's ability to exploit heterogeneous resources, allelopathic potential, ability to regenerate vegetatively, and its early bloom time may provide opportunity for it to spread into native plant communities.

Sources of information:

Waggy, 2009.

1.2. Impact on Natural Community Structure

- | | | |
|----|--|----|
| A. | No perceived impact; establishes in an existing layer without influencing its structure | 0 |
| B. | Influences structure in one layer (e.g., changes the density of one layer) | 3 |
| C. | Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) | 7 |
| D. | Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) | 10 |
| U. | Unknown | |

Score

| |
|---|
| 3 |
|---|

Documentation:

Identify type of impact or alteration:

Ground ivy is a vigorous grower that spreads across the ground forming dense patches that could possibly push out native plants, though most often it seems to create a new layer under existing native plants without greatly impacting those plants. The shade-tolerant nature of ground-ivy makes it problematic because it can invade under a forest canopy

Sources of information:

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

Waggy, 2009.

1.3. Impact on Natural Community Composition

- | | | |
|----|---|----|
| A. | No perceived impact; causes no apparent change in native populations | 0 |
| B. | Influences community composition (e.g., reduces the number of individuals in one or more native species in the community) | 3 |
| C. | Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community) | 7 |
| D. | Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or change the community composition towards species exotic to the natural community) | 10 |
| U. | Unknown | |

Score

| |
|---|
| 3 |
|---|

Documentation:

Identify type of impact or alteration:

It is rather vigorous and can swamp smaller plants. Ground ivy is a vigorous grower that spreads across the ground forming dense patches that push out native plants.

Sources of information:

Plants For A Future, 2012.

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

1.4. Impact on other species or species groups (cumulative impact of this species on the animals, fungi, microbes, and other organisms in the community it invades.

Examples include reduction in nesting/foraging sites; reduction in habitat connectivity; injurious components such as spines, thorns, burrs, toxins; suppresses

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soil/sediment microflora; interferes with native pollinators and/or pollination of a native species; hybridizes with a native species; hosts a non-native disease which impacts a native species)

- A. Negligible perceived impact 0
- B. Minor impact 3
- C. Moderate impact 7
- D. Severe impact on other species or species groups 10
- U. Unknown

Score

| |
|---|
| 3 |
|---|

Documentation:

Identify type of impact or alteration:

It is toxic to many vertebrates, including horses, if eaten in large quantities either fresh or in hay.

Sources of information:

Plants For A Future, 2012.

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

Total Possible

| |
|----|
| 30 |
|----|

Section One Total

| |
|---|
| 9 |
|---|

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode and rate of reproduction

- A. No reproduction by seeds or vegetative propagules (i.e. plant sterile with no sexual or asexual reproduction). 0
- B. Limited reproduction (fewer than 10 viable seeds per plant AND no vegetative reproduction; if viability is not known, then maximum seed production is less than 100 seeds per plant and no vegetative reproduction) 1
- C. Moderate reproduction (fewer than 100 viable seeds per plant - if viability is not known, then maximum seed production is less than 1000 seeds per plant - OR limited successful vegetative spread documented) 2
- D. Abundant reproduction with vegetative asexual spread documented as one of the plants prime reproductive means OR more than 100 viable seeds per plant (if viability is not known, then maximum seed production reported to be greater than 1000 seeds per plant.) 4
- U. Unknown

Score

| |
|---|
| 4 |
|---|

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Each flower produces up to 4 seeds.

Perennial that thrives in moist, shady spots such as under trees and shrubs, but also tolerates sun very well. It spreads vegetatively by creeping stems and to a lesser degree by seed.

Glechoma hederacea is an evergreen Perennial growing to 0.2 m by 1 m. It is not frost tender. It is in leaf January. It is in flower from Mar to May. The flowers are hermaphrodite and are pollinated by Bees.

Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: acid, neutral and basic (alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. Does not tolerate highly acidic or saline soils.

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Sources of information:

Pierce, 2012.
Plants For A Future, 2012.
Plant Invaders of Mid-Atlantic Natural Areas, 2010.
USDA Forest Service, 2006.
Waggy, 2009.

2.2. Innate potential for long-distance dispersal (e.g. bird dispersal, sticks to animal hair, buoyant fruits, pappus for wind-dispersal)

- A. Does not occur (no long-distance dispersal mechanisms) 0
- B. Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations) 1
- C. Moderate opportunities for long-distance dispersal (adaptations exist for long-distance dispersal, but studies report that 95% of seeds land within 100 meters of the parent plant) 2
- D. Numerous opportunities for long-distance dispersal (adaptations exist for long-distance dispersal and evidence that many seeds disperse greater than 100 meters from the parent plant) 4
- U. Unknown

Score

Documentation:

Identify dispersal mechanisms:

Ground-ivy seeds are dispersed primarily by gravity and may be further distributed by ants and other animals.

Sources of information:

Waggy, 2009.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sales, use as forage/revegetation, spread along highways, transport on boats, contaminated compost, land and vegetation management equipment such as mowers and excavators, etc.)

- A. Does not occur 0
- B. Low (human dispersal to new areas occurs almost exclusively by direct means and is infrequent or inefficient) 1
- C. Moderate (human dispersal to new areas occurs by direct and indirect means to a moderate extent) 2
- D. High (opportunities for human dispersal to new areas by direct and indirect means are numerous, frequent, and successful) 3
- U. Unknown

Score

Documentation:

Identify dispersal mechanisms:

Intentional: Brought to the United States because it was thought of as good ground cover for shade and was used as an ornamental or medicinal plant.

Unintentional: Ground-ivy seeds are dispersed primarily by gravity and may be further distributed by ants and other animals

Sources of information:

Pierce, 2012.
Plant Invaders of Mid-Atlantic Natural Areas, 2010.
Waggy, 2009.

2.4. Characteristics that increase competitive advantage, such as shade tolerance, ability to grow on infertile soils, perennial habit, fast growth, nitrogen fixation, allelopathy, etc.

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- A. Possesses no characteristics that increase competitive advantage 0
- B. Possesses one characteristic that increases competitive advantage 3
- C. Possesses two or more characteristics that increase competitive advantage 6
- U. Unknown

Score

Documentation:

Rate of Spread:

HIGH(1-3 yrs) Notes:

Evidence of competitive ability:

It spreads by stolons or by seed. Part of the reason for its wide spread is this rhizomatous method of reproduction. Shade tolerance and fast growth.

Sources of information:

Pierce, 2012.

Plants For A Future, 2012.

2.5. Growth vigor

- A. Does not form thickets or have a climbing or smothering growth habit 0
- B. Has climbing or smothering growth habit, forms a dense layer above shorter vegetation, forms dense thickets, or forms a dense floating mat in aquatic systems where it smothers other vegetation or organisms 2
- U. Unknown

Score

Documentation:

Describe growth form: Ground ivy is a vigorous grower that spreads across the ground forming dense patches that can push out native plants, though it often forms a layer under existing plants.

Sources of information:

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

2.6. Germination/Regeneration

- A. Requires open soil or water and disturbance for seed germination, or regeneration from vegetative propagules. 0
- B. Can germinate/regenerate in vegetated areas but in a narrow range or in special conditions 2
- C. Can germinate/regenerate in existing vegetation in a wide range of conditions 3
- U. Unknown (No studies have been completed)

Score

Documentation:

Describe germination requirements:

It spreads by stolons or by seed. Part of the reason for its wide spread is this rhizomatous method of reproduction.

Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil.

Suitable pH: acid, neutral and basic (alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

Ground-ivy reproduces primarily by vegetative means.

Sources of information:

Pierce, 2012.

Plants For A Future, 2012.

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Waggy, 2009.

2.7. Other species in the genus invasive in Indiana or elsewhere

- A. No 0
- B. Yes 3
- U. Unknown

Score

Documentation:

No other species in the genus invasive in Indiana.

Species:

Total Possible
 Section Two Total

3. ECOLOGICAL AMPLITUDE AND DISTRIBUTION

3.1. Density of stands in natural areas in the northeastern USA and eastern Canada (use same definition as Gleason & Cronquist which is: "The part of the United States covered extends from the Atlantic Ocean west to the western boundaries of Minnesota, Iowa, northern Missouri, and southern Illinois, south to the southern boundaries of Virginia, Kentucky, and Illinois, and south to the Missouri River in Missouri. In Canada the area covered includes Nova Scotia, Prince Edward Island, New Brunswick, and parts of Quebec and Ontario lying south of the 47th parallel of latitude")

- A. No large stands (no areas greater than 1/4 acre or 1000 square meters) 0
- B. Large dense stands present in areas with numerous invasive species already present or disturbed landscapes 2
- C. Large dense stands present in areas with few other invasive species present (i.e. ability to invade relatively pristine natural areas) 4
- U. Unknown

Score

Documentation:

Identify reason for selection, or evidence of weedy history:

Ground ivy is a vigorous grower that spreads across the ground forming dense patches that can push out native plants, but often seems to create a new layer under existing plants.

Sources of information:

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

3.2. Number of habitats the species may invade

- A. Not known to invade any natural habitats given at A2.2 0
- B. Known to occur in two or more of the habitats given at A2.2, with at least one a natural habitat. 1
- C. Known to occur in three or more of the habitats given at A2.2, with at least two a natural habitat. 2
- D. Known to occur in four or more of the habitats given at A2.2, with at least three a natural habitat. 4
- E. Known to occur in more than four of the habitats given at A2.2, with at least four a natural habitat. 6

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U. Unknown

Score

Documentation:

Identify type of habitats where it occurs and degree/type of impacts:
Six habitats identified with two natural in A3.

Sources of information:
See A3.

3.3. Role of disturbance in establishment

- A. Requires anthropogenic disturbances to establish. 0
- B. May occasionally establish in undisturbed areas but can readily establish in areas with natural or anthropogenic disturbances. 2
- C. Can establish independent of any known natural or anthropogenic disturbances. 4
- U. Unknown

Score

Documentation:

Identify type of disturbance:
Most commonly found in disturbed sites.

Sources of information:
Plant Invaders of Mid-Atlantic Natural Areas, 2010.

3.4. Climate in native range

- A. Native range does not include climates similar to Indiana 0
- B. Native range possibly includes climates similar to at least part of Indiana 1
- C. Native range includes climates similar to those in Indiana 3
- U. Unknown

Score

Documentation:

Describe what part of the native range is similar in climate to Indiana:
Ground ivy is native to Europe and Asia which has a very similar climate to Indiana.

Sources of information:
Plant Invaders of Mid-Atlantic Natural Areas, 2010.
USDA, NRCS. 2007.

3.5. Current introduced distribution in the northeastern USA and eastern Canada (see question 3.1 for definition of geographic scope)

- A. Not known from the northeastern US and adjacent Canada 0
- B. Present as a non-native in one northeastern USA state and/or eastern Canadian province. 1
- C. Present as a non-native in 2 or 3 northeastern USA states and/or eastern Canadian provinces. 2
- D. Present as a non-native in 4–8 northeastern USA states and/or eastern Canadian provinces, and/or categorized as a problem weed (e.g., “Noxious” or “Invasive”) in 1 northeastern state or eastern Canadian province. 3
- E. Present as a non-native in >8 northeastern USA states and/or eastern Canadian provinces, and/or categorized as a problem weed (e.g., “Noxious” or “Invasive”) in 2 northeastern states or eastern Canadian provinces. 4
- U. Unknown

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Documentation:

Identify states and provinces invaded:

Ground ivy occurs throughout the U.S. in all of the Lower 48 except for Nevada, Arizona and New Mexico.

Sources of information:

Plant Invaders of Mid-Atlantic Natural Areas, 2010.

3.6. Current introduced distribution of the species in natural areas in Indiana

- | | | |
|----|--|---|
| A. | Present in no Indiana counties | 0 |
| B. | Present in 1-10 Indiana counties | 1 |
| C. | Present in 11-20 Indiana counties | 2 |
| D. | Present in 21-50 Indiana counties | 3 |
| E. | Present in more than 50 Indiana counties or on Federal noxious weed list | 4 |
| U. | Unknown | |

Score

Documentation:

Describe distribution:

Documented in 61 counties of Indiana.

Sources of information:

See A1

| | |
|---------------------|----|
| Total Possible | 25 |
| Section Three Total | 19 |

4. DIFFICULTY OF CONTROL

4.1. Seed banks

- | | | |
|----|--|---|
| A. | Seeds (or vegetative propagules) remain viable in soil for less than 1 year, or does not make viable seeds or persistent propagules. | 0 |
| B. | Seeds (or vegetative propagules) remain viable in soil for at least 1 to 10 years | 2 |
| C. | Seeds (or vegetative propagules) remain viable in soil for more than 10 years | 3 |
| U. | Unknown | |

Score

Documentation:

Ground-ivy's longevity in the soil seed bank may be highly variable but additional research is necessary to understand ground-ivy's seed banking potential in North America.

Sources of information:

Waggy, 2009.

4.2. Vegetative regeneration

- | | | |
|----|---|---|
| A. | No regrowth following removal of aboveground growth | 0 |
| B. | Regrowth from ground-level meristems | 1 |
| C. | Regrowth from extensive underground system | 2 |
| D. | Any plant part is a viable propagule | 3 |
| U. | Unknown | |

Score

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Describe vegetative response:
Spreads by seeds, rhizomes and creeping stems that root at the nodes.

Glechoma hederacea reproduces primarily by vegetative means.

Sources of information:
Pierce, 2012.
Virginia Cooperative Extension, 2013.
Waggy, 2009.

4.3. Level of effort required

- | | | |
|----|---|---|
| A. | Management is not required: e.g., species does not persist without repeated anthropogenic disturbance. | 0 |
| B. | Management is relatively easy and inexpensive: e.g. 10 or fewer person-hours of manual effort (pulling, cutting and/or digging) can eradicate a 1 acre infestation in 1 year (infestation averages 50% cover or 1 plant/100 ft ²). | 2 |
| C. | Management requires a major short-term investment: e.g. 100 or fewer person-hours/year of manual effort, or up to 10 person-hours/year using mechanical equipment (chain saws, mowers, etc.) for 2-5 years to suppress a 1 acre infestation. Eradication is difficult, but possible (infestation as above). | 3 |
| D. | Management requires a major investment: e.g. more than 100 person-hours/year of manual effort, or more than 10 person hours/year using mechanical equipment, or the use of herbicide, grazing animals, fire, etc. for more than 5 years to suppress a 1 acre infestation. Eradication may be impossible (infestation as above). | 4 |
| U. | Unknown | |

Score

| |
|---|
| 3 |
|---|

Documentation:

Identify types of control methods and time-term required:
It survives mowing. Once established, this plant is difficult to control because it is hard to remove all root and stolon fragments. Seed banks may also remain viable after control methods are used. Small patches can be pulled by hand or using a rake when the soil is damp. All roots must be removed. Large infestations can be effectively controlled using systemic herbicides like glyphosate. A rust fungus Puccinia glechomatis attacks ground ivy causing severe damage or death and may hold some potential for biological control.

Sources of information:
Pierce, 2012.
Plant Invaders of Mid-Atlantic Natural Areas, 2010.

| | | |
|--------------------|--|---|
| Total Possible | <table border="1" style="width: 50px; height: 20px;"><tr><td style="text-align: center;">7</td></tr></table> | 7 |
| 7 | | |
| Section Four Total | <table border="1" style="width: 50px; height: 20px;"><tr><td style="text-align: center;">6</td></tr></table> | 6 |
| 6 | | |

| | | |
|--------------------------------------|---|----|
| Total for 4 sections Possible | <table border="1" style="width: 50px; height: 20px;"><tr><td style="text-align: center;">87</td></tr></table> | 87 |
| 87 | | |
| Total for 4 sections | <table border="1" style="width: 50px; height: 20px;"><tr><td style="text-align: center;">52</td></tr></table> | 52 |
| 52 | | |

References for species assessment:

Plants for a Future. 2012. *Glechoma hederacea*-
L. <http://www.pfaf.org/user/Plant.aspx?LatinName=Glechoma+hederacea>. (Web Site Accessed on: Aug 7, 2013).

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Virginia Cooperative Extension. 2013. "Virginia Tech Weed Identification guide". Ground Ivy: *Glechoma hederacea*. http://www.ppws.vt.edu/scott/weed_id/glehe.htm. (Web Site Accessed on: Aug 7, 2013).

Plant Invaders of Mid-Atlantic Natural Areas. 2010. "Herbaceous Forbs".
<http://www.nps.gov/Plants/alien/pubs/midatlantic/glhe.htm>. (Web Site Accessed on: Aug 7, 2013).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 16 March 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Pierce, C. M.F. 2012. "Creeping Charlie". Indiana's Most Unwanted Invasive Plant Pests.
<http://extension.entm.purdue.edu/CAPS/pestInfo/creepingCharlie.htm>.

Waggy, M. A. 2009. "Glechoma hederacea". In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <http://www.fs.fed.us/database/feis/>.
Date Accessed: June 20, 2013.

USDA Forest Service, 2006. Weed of the Week. "Ground Ivy, *Glechoma hederacea*-L.". http://www.na.fs.fed.us/fhp/invasive_plants/weeds/ground-ivy.pdf. (Web Site Accessed on: Aug 7, 2013).

Citation: This IN ranking form may be cited as: Jacquart, E.M. 2011. Invasiveness ranking system for non-native plants of Indiana. Unpublished. Invasive Plant Advisory Committee (IPAC) to the Indiana Invasive Species Council, Indianapolis, IN.

Acknowledgments: The IN ranking form is an adaptation for Indiana use of the form created for New York by Jordan et al. (2009), cited below. Documentation for species assessed for New York are used for Indiana where they are applicable. The Invasive Plant Advisory Committee was created by the Indiana Invasive Species Council in October 2010, and is made up of the original members of the Indiana Invasive Plant Assessment Working Group (IPSAWG). Original members of IPSAWG included representatives of the The Nature Conservancy; Indiana Native Plant and Wildflower Society; Indiana Nursery and Landscape Association; Indiana Chapter of the American Society of Landscape Architects; Indiana Forage Council; Indiana Wildlife Federation; Indiana State Beekeepers Association; Indiana Beekeeper's Association; Department of Natural Resources; Hoosier National Forest; Indiana Academy of Science; Natural Resources Conservation Service; Indiana Department of Environmental Management; Indiana Department of Transportation; Purdue Cooperative Extension Service; Seed Administrator, Office of the Indiana State Chemist.

References for the Indiana ranking form:

Jordan, M.J., G. Moore, and T.W. Weldy. 2009. Invasiveness ranking system for non-native plants of New York. Unpublished. The Nature Conservancy, Cold Spring Harbor, NY; Brooklyn Botanic Garden, Brooklyn, NY; The Nature Conservancy, Albany, NY.

References for the New York ranking form:

Carlson, Matthew L., Irina V. Lapina, Michael Shephard, Jeffery S. Conn, Roseann Densmore, Page Spencer, Jeff Heys, Julie Riley, Jamie Nielsen. 2008. Invasiveness ranking system for non-native plants of Alaska. Technical Paper R10-TPXX, USDA Forest Service, Alaska Region, Anchorage, AK XX9. Alaska Weed Ranking Project may be viewed at: http://akweeds.uaa.alaska.edu/akweeds_ranking_page.htm.

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