

# 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:	Rosa multiflora	USDA Plants Code: ROMU
Common names:	Multiflora rose	
Native distribution:	Eastern Asia	
Date assessed:	July 17, 2012	
Assessors:	Pia Marie Paulone and Ellen Jacquart	
Reviewers:	Ken Collins	
Date Approved:	September 21, 2012	

**Indiana Invasiveness Rank:** Very High (Relative Maximum Score >80.00)

Invasiveness Ranking Summary (see details under appropriate sub-section)		Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	37
2	Biological characteristic and dispersal ability	25 (25)	21
3	Ecological amplitude and distribution	25 (25)	23
4	Difficulty of control	10 (10)	8
	Outcome score	100 (100) <sup>b</sup>	89 <sup>a</sup>
	Relative maximum score <sup>†</sup>		89.00
	Indiana Invasiveness Rank <sup>§</sup>	Very High	

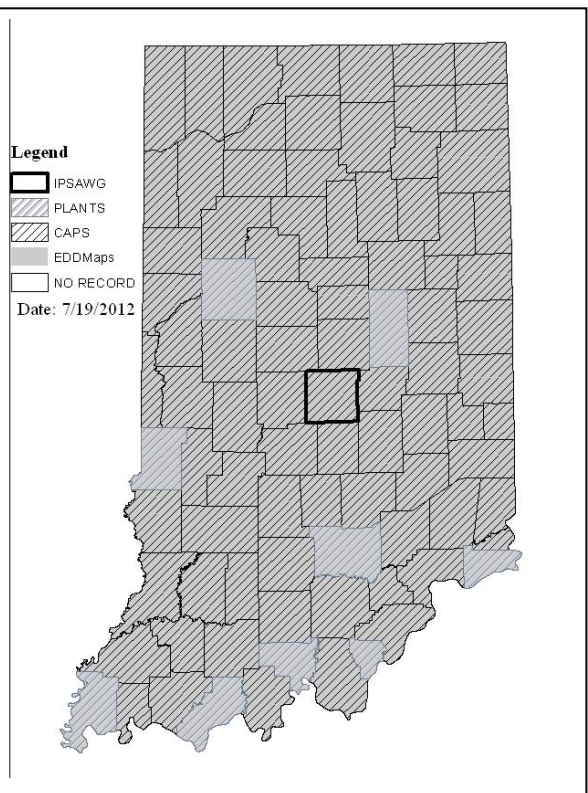
\* For questions answered “unknown” do not include point value in “Total Answered Points Possible.” If “Total Answered Points Possible” is less than 70.00 points, then the overall invasive rank should be listed as “Unknown.”

<sup>†</sup>Calculated as 100(a/b) to two decimal places.

<sup>§</sup>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 type="checkbox"/>	Likely – continue to A3
<input type="checkbox"/>	Not likely



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**Documentation:**

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; Indiana IPSAWG reports (unpublished); and EDDMapS reports, 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://eddmaps.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.

<p><b>Aquatic Habitats</b>                  Rivers/streams                  Natural lakes and ponds                  Reservoirs/impoundments*</p>	<p><b>Wetland Habitats</b>                  Marshes                  Fens                  Bogs                  Shrub swamps  <u>Forested wetlands/riparian</u>                  Beaches/dunes                  Ditches*</p>	<p><b>Upland Habitats</b>  <u>Forest</u>  <u>Savannas</u>  <u>Barrens</u>  <u>Prairies</u>  <u>Cultivated*</u>  <u>Old Fields*</u>  <u>Roadsides*</u></p>
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Other potential or known suitable habitats within Indiana:  
 No additional habitats.

**Documentation:**

Sources of information:  
 Brooklyn Botanic Garden, 2009; Ma & Moore, 2009.

**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)

- |  |                                      |
|--|--------------------------------------|
| <p>A. No perceivable impact on ecosystem processes based on research studies, or the absence of impact information if a species is widespread (&gt;10 occurrences in minimally managed areas), has been well-studied (&gt;10 reports/publications), and has been present in the northeast for &gt;100 years.</p> <p>B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability)</p> <p>C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl)</p> <p>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)</p> <p>U. Unknown</p> | <p>0</p> <p>3</p> <p>7</p> <p>10</p> |
|--|--------------------------------------|

Score 7

**Documentation:**

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

Large dense thickets significantly reduce light availability.

Sources of information:

Auro, 2002; Huebner, 2003; Meiners, 2007.

1.2. Impact on Natural Community Structure

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- 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

**Documentation:**

Identify type of impact or alteration:

Species grows as vine, shrug, and various forms in between, allowing it to impact herbaceous and understory shrub layers, plus increase density of shrub layer by itself. In some situations it will not only create a new layer but eradicate all layers below it forming a impenetrable thicket.

Sources of information:

Robertson et al. 1994; Lu, 2004; Ma & Moore, 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

**Documentation:**

Identify type of impact or alteration:

Substantially increases woody plant layers, outcompeting native woody and herbaceous species.

Sources of information:

Eckardt, 1987; Auro, 2002; Merriam, 2003; Ma & Moore, 2009.

**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 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

**Documentation:**

Identify type of impact or alteration:

Some evidence that species is detrimental to nesting birds. Species pollinated by a large number of native pollinators, the large flower displays of *R. multiflora* possibly

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outcompeting other native flowers species for visitations. Species also supports large number of mite species, one of which, *Phyllocoptes fructiphilus*, has been implicated in rose rosette disease (presumably caused by a virus). This disease affects other native and cultivated rose species; to date no rose species has been shown to be totally resistant to the disease. More studies are needed on what impact the disease may be having on native rose species. Species is also exceptionally thorny.

Sources of information:

Hunter & Mattice, 2002; Hong, Hansen, & DeBolt, 2002; Swearingen et al., 2002; Lundgren et al., 2004; Jesse et al., 2006a, 2006b; Ma & Moore, 2009.

Total Possible	40
Section One Total	37

**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
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**Documentation:**

Describe key reproductive characteristics (including seeds per plant):

Reproduction by seed and by forming new plants that root from the tips of arching canes that contact the ground. Reported that one plant can produce up to million seeds per year (Swearingen et al., 2002).

Sources of information:

Lu, 2004; Doll, 2006; Bergmann & Swearingen, 2002.

**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 

4
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**Documentation:**

Identify dispersal mechanisms:

Seeds dispersed by many kinds of birds and mammals that eat the fruit (hips).

Sources of information:

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Scott, 1965; Albaugh et al., 1997; Barber & Meade, 1980; Doll, 2006; Bergmann & Swearingen, 2007.

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:

Cultivated in the past, then abandoned, especially in urban areas and old fields; indirect spread through yard waste and compost. In the past, it was used for understock for grafting of cultivated rose species. Understock can sprout and flower in some cases. The species appears to currently have limited use as understock.

Sources of information:

Huebner, 2003; Lu, 2004; Ma & Moore, 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.

- 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:**

Evidence of competitive ability:

Perennial, ability to grow on poor soils; shade tolerant.

Sources of information:

Eckardt, 1987; Hunter & Mattice, 2002; Lu, 2004; Doll, 2006.

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:

Forms thickets

Sources of information:

Robertson et al. 1994; Merriam, 2003; Lu, 2004; Ma & Moore, 2009.

2.6. Germination/Regeneration

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- 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 

3
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**Documentation:**  
 Describe germination requirements:  
 The seeds germinate readily following deposition in the soil; tip-rooting is commonly encountered.  
 Sources of information:  
 Eckardt, 1987.

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

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

Score 

0
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**Documentation:**  
 Species:  
 Other non-native rose species in Indiana and elsewhere are not known to be invasive.

Total Possible 

25
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 Section Two Total 

21
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**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 

4
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**Documentation:**  
 Identify reason for selection, or evidence of weedy history:  
 Large stands have been observed in areas with few other invasive species.  
 Sources of information:  
 Lu, 2004; Lundgren et al. 2004; Ma & Moore, 2009, Jacquot personal observation

**3.2. Number of habitats the species may invade**

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- 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
- U. Unknown

Score

**Documentation:**

Identify type of habitats where it occurs and degree/type of impacts:

See A2.2.

Sources of information:

**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:

Occasionally establishes in relatively undisturbed areas but readily establishes in areas with recent disturbance

Sources of information:

Lu, 2004; Doll, 2006; Ma & Moore, 2009.

**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:

Eastern Asia, including Japan, Korea, and eastern China

Sources of information:

Brooklyn Botanic Garden, 2009.

**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. 4

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and/or categorized as a problem weed (e.g., “Noxious” or “Invasive”) in 2 northeastern states or eastern Canadian provinces.

U. Unknown

Score

**Documentation:**

Identify states and provinces invaded:

CT, DC, DE, IL, IN, KY, MA, MD, ME, MI, MN, MO, NH, NJ, NY, OH, PA, RI, VA, VT, WI, WV; NB, NS, ON, QC.

Sources of information:

See known introduced range in [plants.usda.gov](http://plants.usda.gov), and update with information from states and Canadian provinces.

U.S.D.A., 2009.

**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:

See A1.1.

Sources of information:

Total Possible	<input style="width: 50px; border: 1px solid black;" type="text" value="25"/>
Section Three Total	<input style="width: 50px; border: 1px solid black;" type="text" value="23"/>

**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:**

Identify longevity of seed bank:

Seeds may remain viable in the soil for 10-20 years.

Sources of information:

Swearingen et al., 2002; Szafoni, 2002; Doll, 2006.

**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 |



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- D. Any plant part is a viable propagule 3  
U. Unknown

Score 

1
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**Documentation:**

Describe vegetative response:

New Plants can be produced by resprouting and from tips of arching canes that contact the ground; regrowth does not occur from extensive underground root system.

Sources of information:

Eckardt, 1987; Bergmann & Swearingen, 2007.

**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<sup>2</sup>). 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 

4
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**Documentation:**

Identify types of control methods and time-term required:

Cutting or mowing 3-6 times per year (Bergmann, 1997) or once per year after initial invasion (Auro, 2002). Even though multiflora rose can be controlled through mechanical or chemical (e.g., glyphosate) means, the large number of long viable seeds in the soil requires long term management greater than five years (Swearingen et al., 2002).

Sources of information:

Lu, 2004; Swearingen et al., 2002; Doll, 2006.

Total Possible 

10
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Section Four Total 

8
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**Total for 4 sections Possible**

100
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**Total for 4 sections**

89
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**References for species assessment:**

Albaugh, G.P., W.H. Mitchell, and J.C. Graham. 1977. Evaluation of glyphosate for multiflora rose control. Proceedings NE Weed Science Society 31: 283-291.

Auro, P. 2002. Introduced species summary project: Multiflora rose (*Rosa multiflora*), Introduced Species Summary Project, Columbia University <[http://www.columbia.edu/itc/cerc/danoffburg/invasion\\_bio/inv\\_spp\\_summ/Rosa\\_multiflora.html](http://www.columbia.edu/itc/cerc/danoffburg/invasion_bio/inv_spp_summ/Rosa_multiflora.html)> [Accessed on Jan. 21, 2009].

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Doll, J. D. 2006. Biology of Multiflora Rose. 2006 North Central Weed Science Society Proceedings 61: 239 <<http://www.ncwss.org/proceed/2006/abstracts/239.pdf>> [Accessed on Jan. 21, 2009].

Eckardt, N. 1987. Element Stewardship abstract for Rosa multiflora, Wild Carrot, The Nature Conservancy, Arlington, VA <<http://tncinvasives.ucdavis.edu/esadocs/documnts/rosamul.pdf>> [Accessed on Jan. 21, 2009].

Hong, C., M. A. Hansen, S. DeBolt. 2002. Rose rosette disease. Virginia Cooperative Extension. Publication No. 45-620.

Huebner, C. D. 2003. Vulnerability of Oak-Dominated Forests in West Virginia to Invasive Exotic Plants: Temporal and Spatial Patterns of Nine Exotic Species Using Herbarium Records and Land Classification data. *Castanea* 68(1): 1-14.

Hunter, J. C. & J. A. Mattice, 2002. The spread of woody exotics into the forests of a northeastern landscape, 1938-1999. *Journal of the Torrey Botanical Society* 129(3): 220-227.

Jesse, L. C., K. A. Moloney, and J. J. Obrycki. 2006a. Abundance of arthropoda on the branch tips of the invasive plant, *Rosa multiflora* (Rosaceae). *Weed Biology and Management* 6: 204-211.

Jesse, L. C., K. A. Moloney, and J. J. Obrycki. 2006b. Insect pollinators of the invasive plant *Rosa multiflora* (Rosaceae). *Weed Biology and Management* 6: 235-240.

Lu, S. 2004. *Rosa multiflora*. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer. <[www.natureserve.org](http://www.natureserve.org)>. [Accessed on Jan. 21, 2009].

Lundgren, M. R., C. J. Small & G. D. Dreyer, 2004. Influence of Land Use and Site Characteristics on Invasive Plant Abundance in the Quinebaug Highlands of Southern New England. *Northeastern Naturalist* 11(3): 313-332.

Ma, J. & G. Moore. 2009. Invasiveness ranking system for non-native plants of New York: Multiflora rose. Unpublished. The Nature Conservancy, Cold Spring Harbor, NY; Brooklyn Botanic Garden, Brooklyn, NY; The Nature Conservancy, Albany, NY.

Meiners, S. J. 2007. Apparent competition: an impact of exotic shrub invasion of tree regeneration. *Biological Invasions* 9(7): 849-855.

Merriam, R. W. 2003. The abundance, distribution and edge associations of six non-indigenous, harmful plants across North Carolina. *Journal of the Torrey Botanical Society* 130(4): 283-291.

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Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. 2002. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service, 82 pp.

Szafoni, B. 2002. Vegetation Management Guideline - Multiflora Rose (*Rosa multiflora*), The Illinois Nature Preserves Commission <<http://www.inhs.uiuc.edu/chf/outreach/VMG/mrose.html>> [Accessed on Jan. 21, 2009].

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**Citation:** This IN ranking form may be cited as: Jacquart, E.M. 2012. Invasiveness ranking system for non-native plants of Indiana. Unpublished. Invasive Plant Advisory Committee (IPAC) to the Indiana Invasive Species Council, Indianapolis, IN.

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**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

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