

# NEW YORK NON-NATIVE PLANT INVASIVENESS RANKING FORM

Scientific name: Eleutherococcus pentaphyllus (Siebold & Zucc.) Nakai (Synonyms: Eleutherococcus sieboldianus (Makino) Koidzumi; Acanthopanax sieboldianus Makino      USDA Plants Code: ELPE6)  
 Common names: Five-leaved Aralia  
 Native distribution: East Asia  
 Date assessed: February 23, 2012; revised 31 July & Aug.14, 2012  
 Assessors: Steven D. Glenn and LIISMA Scientific Review Committee  
 Reviewers: LIISMA SRC  
 Date Approved: 15 May 2012; 31 July and 14 Aug., 2012      Form version date: 29 April 2011

**New York Invasiveness Rank:** Not Assessable

<b>Distribution and Invasiveness Rank</b> (Obtain from PRISM invasiveness ranking form)		
Status of this species in each PRISM:	Current Distribution	PRISM Invasiveness Rank
1 Adirondack Park Invasive Program	Not Assessed	Not Assessed
2 Capital/Mohawk	Not Assessed	Not Assessed
3 Catskill Regional Invasive Species Partnership	Not Assessed	Not Assessed
4 Finger Lakes	Not Assessed	Not Assessed
5 Long Island Invasive Species Management Area	Not Present	Not Assessable
6 Lower Hudson	Not Assessed	Not Assessed
7 Saint Lawrence/Eastern Lake Ontario	Not Assessed	Not Assessed
8 Western New York	Not Assessed	Not Assessed

  

<b>Invasiveness Ranking Summary</b> (see details under appropriate sub-section)		Total (Total Answered*) Possible	Total
1	Ecological impact	40 (0)	0
2	Biological characteristic and dispersal ability	25 (18)	9
3	Ecological amplitude and distribution	25 (21)	9
4	Difficulty of control	10 (3)	2
	Outcome score	100 (42) <sup>b</sup>	20 <sup>a</sup>
	Relative maximum score †		--
	New York Invasiveness Rank §	Not Assessable	

\* 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

Not Assessable: not persistent in NY, or not found outside of cultivation.

### A. DISTRIBUTION (KNOWN/POTENTIAL): Summarized from individual PRISM forms

A1.1. Has this species been documented to persist without cultivation in NY? (reliable source; voucher not required)		
<input type="checkbox"/>	Yes – continue to A1.2	
<input checked="" type="checkbox"/>	No – continue to A2.1	
A1.2. In which PRISMs is it known (see inset map)?		
<input type="checkbox"/>	Adirondack Park Invasive Program	
<input type="checkbox"/>	Capital/Mohawk	
<input type="checkbox"/>	Catskill Regional Invasive Species Partnership	
<input type="checkbox"/>	Finger Lakes	
<input type="checkbox"/>	Long Island Invasive Species Management Area	
<input type="checkbox"/>	Lower Hudson	
<input type="checkbox"/>	Saint Lawrence/Eastern Lake Ontario	
<input type="checkbox"/>	Western New York	

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Documentation: Brooklyn Botanic Garden, 2012; Weldy & Werier, 2012.  
Sources of information:

A2.1. What is the likelihood that this species will occur and persist outside of cultivation, given the climate in the following PRISMs? (obtain from PRISM invasiveness ranking form)

Not Assessed	Adirondack Park Invasive Program
Not Assessed	Capital/Mohawk
Not Assessed	Catskill Regional Invasive Species Partnership
Not Assessed	Finger Lakes
Moderately Likely	Long Island Invasive Species Management Area
Not Assessed	Lower Hudson
Not Assessed	Saint Lawrence/Eastern Lake Ontario
Not Assessed	Western New York

Documentation: While in cultivation in the LIISMA PRISM since the 1920's (Grier & Grier, 1929), there are only 13 records in the BBG database for the NYC metro area, and most may be remnants of cultivation. Three are from Fisher's Island (Suffolk Co.) and were reported by Gordon Tucker with a specimen. G. Tucker confirmed 6/25/2012 in an email to Steve Young that all were in a swamp in a hollow at the south end of Hay Harbor near Van Ooster Place (2000) and appeared to be escapes from cultivation. However they were destroyed by development by 2012 (D. Werier). -- Clark stated that "previous reports of fiveleaf aralia were based on specimens persistent after cultivation." One report from the Catskills was found to be within the edge of a commercial nursery and likely originated from dumped nursery waste. We will consider remaining reports from the NYC Metro area to be remnants of cultivation unless we find convincing documentation that they are escapes: One report from Queens (Forest Park), two from Richmond Co. (Staten Island), two in NY Co. (Manhattan), one in Westchester ("spreading vegetatively; uncertain cultivated status") (S. Glenn BBG, 2012), two in NJ and one in CT. There are reports from several other northeastern and Mid-Atlantic States (see Question 3.5); some of these state reports might include remnants of cultivation (SRC). NatureServe lists occurrences in CT, KY, MA, PA, UT and Ontario but has not yet assessed the species and given it an IRANK.

Sources of information (e.g.: distribution models, literature, expert opinions):  
BBG, 2012; Grier & Grier, 1929; K.Laveroni 2012 (pers comm. and satellite image) Gordon Tucker; Clark (2005); D. Werier (pers. comm.) 2012.

***If the species does not occur and is not likely to occur in any of the PRISMs, then stop here as there is no need to assess the species. Rank is "Not Assessable."***

A2.2. What is the current distribution of the species in each PRISM? (obtain rank from PRISM invasiveness ranking forms)

	Distribution
Adirondack Park Invasive Program	Not Assessed
Capital/Mohawk	Not Assessed
Catskill Regional Invasive Species Partnership	Restricted
Finger Lakes	Not Assessed
Long Island Invasive Species Management Area	Restricted
Lower Hudson	Not Assessed
Saint Lawrence/Eastern Lake Ontario	Not Assessed
Western New York	Not Assessed

Documentation: LIISMA: Reported from Suffolk Co. (Fisher's Island) in 2000 which probably had been an escape from cultivation, but the area in which it occurred was destroyed for development by 2012. There is one report from Queens (Forest Park) which may be a cultivated remnant, and two from Richmond Co. (Staten Island). It is unclear if these occurrences are escapes from cultivation. CRISP: Reported occurrence on Catskills Creek, Freehold NY, adjacent to Story's Nursery. Unclear if this should be considered an escape since it is right on the edge of a nursery.

Sources of information:  
BBG 2012; Verschuur 2007 and Laveroni 2012 (personal communication, aerial map and photographs).

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A2.3. Describe the potential or known suitable habitats within New York. Natural habitats include all habitats not under active human management. Managed habitats are indicated with an asterisk.

- |   |  |   |
|---|--|---|
| <b>Aquatic Habitats</b><br><input checked="" type="checkbox"/> Salt/brackish waters<br><input type="checkbox"/> Freshwater tidal<br><input type="checkbox"/> Rivers/streams<br><input type="checkbox"/> Natural lakes and ponds<br><input type="checkbox"/> Vernal pools<br><input type="checkbox"/> Reservoirs/impoundments* | <b>Wetland Habitats</b><br><input type="checkbox"/> Salt/brackish marshes<br><input type="checkbox"/> Freshwater marshes<br><input type="checkbox"/> Peatlands<br><input type="checkbox"/> Shrub swamps<br><input type="checkbox"/> Forested wetlands/riparian<br><input type="checkbox"/> Ditches*<br><input type="checkbox"/> Beaches and/or coastal dunes | <b>Upland Habitats</b><br><input checked="" type="checkbox"/> Cultivated*<br><input type="checkbox"/> Grasslands/old fields<br><input checked="" type="checkbox"/> Shrublands<br><input checked="" type="checkbox"/> Forests/woodlands<br><input type="checkbox"/> Alpine<br><input checked="" type="checkbox"/> Roadsides* |
|---|--|---|

Other potential or known suitable habitats within New York:

Documentation: hedgerows, open forests, woodland edge, damp hollow. Planted for barrier hedges and screening (has sharp prickles).

Sources of information:

Clark et al., 2005; Dirr 2011; Lamont & Young 2002; NJISST 2012; Redman 2002; Thompson et al., 2009

**B. INVASIVENESS RANKING**

Questions apply to areas similar in climate and habitats to New York 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 

U
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Documentation:

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

No literature regarding ecological impact could be located. Laveroni reported the occurrence on Catskills Creek, Freehold NY was dense enough to reduce light levels beneath.

Sources of information:

Laveroni 2012 (pers. comm. and images)

1.2. Impact on Natural Community Structure

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

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U. Unknown

Score 

U
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<b>Documentation:</b> Identify type of impact or alteration: No literature regarding the impact of this species on natural community structure could be located Sources of information:	
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**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 

U
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<b>Documentation:</b> Identify type of impact or alteration: Only one source could be found which regards this species as highly threatening to natural communities (NJSST, 2012) but clear documentation is needed. This species is not listed on IPANE (Mehrhoff et al., 2003) nor on CIWPG (CIWPG, 2011) Sources of information:	
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**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 

U
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<b>Documentation:</b> Identify type of impact or alteration: No literature regarding the impact on other species could be located. Plant has prickles but no evidence of harm in natural areas. Sources of information:	
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	Total Possible	0
	Section One Total	0

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**2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY**

**2.1. Mode and rate of reproduction**

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- 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 (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 OR vegetative asexual spread documented as one of the plants prime reproductive means) 4
- U. Unknown

Score 2

**Documentation:**

Describe key reproductive characteristics (including seeds per plant):

This species can produce abundant flowers (Schnelle, 1995) and berries with 2-7 seeds, but few fruits produced in cultivation (Iwatsuki, K., et al., 1999; UCONN, 2012) and the berries often fail to set seed (Schnelle, 1995).

This species reportedly suckers freely (Koller, 1981).

Sources of information:

Iwatsuki k., et al., 1999; Koller, 1981; Schnelle, 1995; UCONN, 2012

**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 U

**Documentation:**

Identify dispersal mechanisms:

No literature could be found regarding long-distance dispersal of *E. pentaphyllus* propagules; but a sister species from Japan, *E. sciadophylloides*, has demonstrated avian frugivore dispersal (Nakanishi, 1996).

Sources of information:

Nakanishi, 1996

**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

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Score 

1
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**Documentation:**

Identify dispersal mechanisms:

Used as a landscaping plant. While some indicate this species is difficult almost impossible to locate in commerce (Dirr, 2011), others state that it is commercially available for landscaping (Koller, 1981; UCONN, 2012; NJISST, 2012) and has been in cultivation on Long Island in the 1920's (Grier & Grier, 1929).

Sources of information:

Dirr, 2011; Grier & Grier, 1929; Koller, 1981; NJISST, 2012; UCONN, 2012

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 

6
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**Documentation:**

Evidence of competitive ability:

Shade tolerant, perennial, tolerates varied types of soil: This species will prevail in urban situations, highly tolerant of a wide range of conditions (NJISST, 2012; Schnelle, 1995; UCONN, 2012), and quite tolerant of pollution (Dirr, 2011; Koller, 1981; Schnelle, 1995; UCONN, 2012). It tolerates sun to heavy shade (Koller, 1981; Schnelle, 1995; UCONN, 2012). It's adaptable to alkaline, heavy, sandy, dry or poor soils (Koller, 1981; Schnelle, 1995; UCONN, 2012), and reportedly escapes to calcareous areas in Japan (Iwatsuke, et al., 1999).

Leaves remain green late into fall (NJISST, 2012; Schnelle, 1995) which may provide the potential to supply extra photosynthates.

Foliage is pest-free (Koller, 1981; Schnelle, 1995) and spines (Dirr, 2011; Iwatsuke, et al., 1999; Koller, 1981; NJISST, 2012; Schnelle, 1995; UCONN, 2012) may inhibit herbivory.

Sources of information:

Dirr, 2011; Iwatsuke, et al., 1999; Koller, 1981; NJISST, 2012; Schnelle, 1995; UCONN, 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 

0
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**Documentation:**

Describe growth form:

One author states that the growth rate is moderate (Koller, 1981), while another states that this species can be a rampant grower on ideal sites (UCONN, 2012). There is no reference to this species possessing a smothering or climbing habit.

Sources of information:

Koller, 1981; UCONN, 2012

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 |

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- C. Can germinate/regenerate in existing vegetation in a wide range of conditions 3  
 U. Unknown (No studies have been completed)

Score 

U
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**Documentation:**  
 Describe germination requirements:  
 One source states that a 6 month warm/3 month cold stratification yields good germination results (Dirr & Heuser, 2006), but no reference could be located regarding germination in natural conditions.  
 Sources of information:  
 Dirr & Heuser, 2006

**2.7. Other species in the genus invasive in New York or elsewhere**

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

Score 

0
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**Documentation:**  
 Species:  
 No other species of Eleutherococcus in North America (USDA, 2012).

Total Possible 

18
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 Section Two Total 

9
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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 

0
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**Documentation:**  
 Identify reason for selection, or evidence of weedy history:  
 No reported large stands could be found in literature. Verschoor reported an occurrence in the Catskills, Freehold NY, Greene County immediately adjacent to Story's Nursery in 2007. Laveroni photo-documented this occurrence as a small (<<1/4 acre) but dense patch in a vegetated strip along Catskills Creek in 2012 with many other invasive species present. Evidence of flooding was also noted. Unclear if this should be considered an escape since it is right on the edge of a nursery.  
 Sources of information:  
 Verschoor 2007; Laveroni 2012.

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

- A. Not known to invade any natural habitats given at A2.3 0  
 B. Known to occur in one natural habitat given at A2.3 1

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- C. Known to occur in two natural habitats given at A2.3 2
- D. Known to occur in three natural habitat given at A2.3 4
- E. Known to occur in four or more natural habitats given at A2.3 6
- U. Unknown

Score 2

**Documentation:**

Identify type of habitats where it occurs:  
see A2.3

Sources of information:

Clark, et al., 2005; Dirr, 2011; Lamont & Young, 2002; NJISST, 2012; Redman, 2002;  
Thompson, et al., 2009

**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 U

**Documentation:**

Identify type of disturbance:

No refernces regarding role of disturbance in establishment could be located. Species can establish in disturbed areas (e.g. flooded riverbanks) but ability to establish in undisturbed areas even occasionally is unknown.

Sources of information:

**3.4. Climate in native range**

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

Score 3

**Documentation:**

Describe what part of the native range is similar in climate to New York:

Native to northeast Asia (UCONN, 2012; Iwatsuke, et al., 1999; Koller, 1981; Ohwi, 1984; Zhengyi et al., 2007) and rated hardy in North America to zone 4 (Dirr, 2011; Schnelle, 1995; UCONN, 2012) or to -25 F (Koller, 1981).

Sources of information:

Dirr, 2011; Iwatsuke, et al., 1999; Koller, 1981; Ohwi, 1984; Schnelle, 1995; UCONN, 2012;  
Zhengyi et al., 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



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U. Unknown

Score 

4
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**Documentation:**

Identify states and provinces invaded:

CT, IA, IN, KY, MA, MD, OH, NJ, PA, WV; Ontario. Some OR MOST of these state reports might include remnants of cultivation (SRC). Documented as naturalizing in New England by arthurhaines@wildblue.net (New England's top botanist) though he has not personally seen populations (email to Steve Young 6/28/2012).

Sources of information: See known introduced range in plants.usda.gov, and update with information from states and Canadian provinces.

BBG, 2012; Clark, et al., 2005; Lamont & Young, 2002; NJISST, 2012; Redman, 2002; Thompson, et al., 2009; USDA, 2012.

**3.6. Current introduced distribution of the species in natural areas in the eight New York State PRISMs (Partnerships for Regional Invasive Species Management)**

- |   |   |
|---|---|
| A. Present in none of the PRISMs                                      | 0 |
| B. Present in 1 PRISM   | 1 |
| C. Present in 2 PRISMs  | 2 |
| D. Present in 3 PRISMs  | 3 |
| E. Present in more than 3 PRISMs or on the Federal noxious weed lists | 4 |
| U. Unknown  |   |

Score 

0
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**Documentation:**

Describe distribution:

Occurrence in LIISMA (Fisher's Island) has been destroyed by development; Lower Hudson (Westchester) and CRISP (Caskills) were both determined not to be escapes from cultivation.

Sources of information:

BBG, 2012; Lamont & Young, 2002; Weldy & Werier, 2012

Total Possible	<table border="1" style="display: inline-table;"><tr><td style="width: 40px; text-align: center;">21</td></tr></table>	21
21		
Section Three Total	<table border="1" style="display: inline-table;"><tr><td style="width: 40px; text-align: center;">9</td></tr></table>	9
9		

**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 

U
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**Documentation:**

Identify longevity of seed bank:

No refernces regarding seed banking could be located.

Sources of information:

**4.2. Vegetative regeneration**

- |  |   |
|--|---|
| A. No regrowth following removal of aboveground growth | 0 |
|--|---|

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- 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 

2
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**Documentation:**

Describe vegetative response:

This species reportedly suckers freely (Koller, 1981).

Sources of information:

Koller, 1981

**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 

U
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**Documentation:**

Identify types of control methods and time-term required:

No references regarding eradication or management could be located.

Sources of information:

Total Possible	3
Section Four Total	2

<b>Total for 4 sections Possible</b>	42
<b>Total for 4 sections</b>	20

**C. STATUS OF CULTIVARS AND HYBRIDS:**

At the present time (May 2008) there is no protocol or criteria for assessing the invasiveness of cultivars independent of the species to which they belong. Such a protocol is needed, and individuals with the appropriate expertise should address this issue in the future. Such a protocol will likely require data on cultivar fertility and identification in both experimental and natural settings.

Hybrids (crosses between different parent species) should be assessed individually and separately from the parent species wherever taxonomically possible, since their invasiveness may differ from that of the parent species. An exception should be made if the taxonomy of the species and hybrids are uncertain, and species and hybrids can not be clearly distinguished in the field. In such cases it is not feasible to distinguish species and hybrids, and they can only be assessed as a single unit.

Some cultivars of the species known to be available: 'Variegatus'

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**Acknowledgments:** The NY form incorporates components and approaches used in several other systems, cited in the references below. Valuable contributions by members of the Long Island Invasive Species Management Area's Scientific Review Committee were incorporated in revisions of this form. Original members of the LIISMA SRC included representatives of the Brooklyn Botanic Garden; The Nature Conservancy; New York Natural Heritage Program, New York Sea Grant; New York State Office of Parks, Recreation and Historic Preservation; National Park Service; Brookhaven National Laboratory; New York State Department of Environmental Conservation Region 1; Cornell Cooperative Extension of Suffolk/Nassau Counties; Long Island Nursery and Landscape Association; Long Island Farm Bureau; SUNY Farmingdale Ornamental Horticulture Department; Queens College Biology Department; Long Island Botanical Society; Long Island Weed Information Management System database manager; Suffolk County Department of Parks, Recreation and Conservation; Nassau County Department of Parks, Recreation and Museums; Suffolk County Soil & Water Conservation District.

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