

NEW YORK
NON-NATIVE PLANT INVASIVENESS RANKING FORM
FOR NATURAL / MINIMALLY MANAGED AREAS

Scientific name: Lysimachia nummularia L. USDA Plants Code: NYLU
 Common names: Creeping Jenny, moneywort
 Native distribution: Europe, southwest Asia
 Date assessed: 8 Oct. 2008; 29 Feb.2009; 3 April 2009; 11 March 2010; 9 Feb. 2011; 17 Jan. 2013
 Assessors: Steve Glenn, Gerry Moore; revised Marilyn Jordan and SRC
 Reviewers: LIISMA SRC
 Date Approved: 9 February 2011; 17 Jan. 2013 Form version date: 28 November 2012

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

| Distribution and Invasiveness Rank (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 | Common | Moderate |
| 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 |

| Invasiveness Ranking Summary (see details under appropriate sub-section) | | Total (Total Answered*) Possible | Total |
|--|---|---|-----------------|
| 1 | Ecological impact | 40 (<u>30</u>) | 13 |
| 2 | Biological characteristic and dispersal ability | 25 (<u>22</u>) | 16 |
| 3 | Ecological amplitude and distribution | 25 (<u>25</u>) | 21 |
| 4 | Difficulty of control | 10 (<u>7</u>) | 4 |
| Outcome score | | 100 (<u>84</u>) ^b | 54 ^a |
| Relative maximum score [†] | | | 64.29 |
| New York Invasiveness Rank (for natural areas) [§] | | Moderate (Relative Maximum Score 50.00-69.99) | |

* 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 checked="" type="checkbox"/> | Yes – continue to A1.2 | |
| <input type="checkbox"/> | No – continue to A2.1 | |
| A1.2. In which PRISMs is it known (see inset map)? | | |
| <input checked="" type="checkbox"/> | Adirondack Park Invasive Program | |
| <input checked="" type="checkbox"/> | Capital/Mohawk | |
| <input checked="" type="checkbox"/> | Catskill Regional Invasive Species Partnership | |
| <input checked="" type="checkbox"/> | Finger Lakes | |
| <input checked="" type="checkbox"/> | Long Island Invasive Species Management Area | |
| <input checked="" type="checkbox"/> | Lower Hudson | |
| <input checked="" type="checkbox"/> | Western New York | |

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Documentation:

Sources of information:

Weldy & Werier, 2005; Brooklyn Botanic Garden, 2008.

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 |
| Very Likely | Long Island Invasive Species Management Area |
| Not Assessed | Lower Hudson |
| Not Assessed | Saint Lawrence/Eastern Lake Ontario |
| Not Assessed | Western New York |

Documentation:

Sources of information (e.g.: distribution models, literature, expert opinions):

Weldy & Werier, 2005; Brooklyn Botanic Garden, 2008.

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 | Not Assessed |
| Finger Lakes | Not Assessed |
| Long Island Invasive Species Management Area | Common |
| Lower Hudson | Not Assessed |
| Saint Lawrence/Eastern Lake Ontario | Not Assessed |
| Western New York | Not Assessed |

Documentation:

Sources of information:

Weldy & Werier, 2005; Brooklyn Botanic Garden, 2008.

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.

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

Other potential or known suitable habitats within New York:

Documentation:

Sources of information:

Van Vechten & Buell, 1959; Barnes et al., 1971 (England edge of salt pond); Bell, 1974; Gaudet & Keddy, 1995; Mills et al., 1996; Hughes & Cass, 1997; Luken & Thieret, 2001; Aronson et al., 2004; Mehrhoff et al., 2004; Brooklyn Botanic Garden, 2008 (1961 Kalbfleisch (Suffolk Co.) specimen); author's (Glenn's) personal observations.

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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)

- A. No perceivable impact on ecosystem processes based on research studies OR there are no reports of impacts and the 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 3

Documentation:

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

Can disrupt water flow of springs and seeps (Mehrhoff et al., 2004). One study found increased rate of redox reactions in soil (Justin & Armstrong, 1987 Table 2) but impacts on soil chemistry (e.g. nutrients, pH etc.) unclear. Another study (Eom et al., 2005) found in study of groundcover plants that the mats of *Lysimachia nummularia* 'aurea' reduce light hitting the soil surface by over 80%. SRC noted that the species has been in New England "...at least as early as the 1870s" (Mehrhoff) but there is no evidence of major impacts on ecosystem processes.

Sources of information:

Justin & Armstrong, 1987; Mehrhoff, 2004; Eom et al., 2005; .

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 7

Documentation:

Identify type of impact or alteration:

Significantly increases the density of the herb layer, and may create a layer where none had existed.

Sources of information:

Mehrhoff et al., 2004; Eom et al., 2005; Gravuer, 2006; S. Young NYNHP database.

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

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- native species in the community)
- 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:

May reduce population size of some native species in herb layer; evidence lacking of significant reduction or extirpation of native species.

Sources of information:

Mehrhoff et al., 2004; Eom et al., 2005; Gravuer, 2006; K. Smith, J. Lundgren and S. Young NYNHP database and pers.comm.

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 |
|---|

Documentation:

Identify type of impact or alteration:

Gravuer (2006) assumes impacts are not significant but studies are lacking. Studies need on the possible pollination of this species by rare native bees; also, possibly decreasing the pollination of native *Lysimachia* species by native bees (L. Bavaro, pers. communications).

Sources of information:

Gravuer, 2006; L. Bavaro pers. communications.

Total Possible

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

Section One Total

| |
|----|
| 13 |
|----|

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). Such a species should be ranked “Not Assessable” as it will occur only in cultivated settings and cannot escape into natural/minimally managed areas. End the assessment here. 0
- B. Limited reproduction (fewer than 10 viable seeds per plant; if seed viability is not known, then maximum seed production is less than 100 seeds per plant) AND no reproduction by vegetative propagules (e.g. bulbils, turions, pieces of rhizomes, etc.) is documented as a natural (not spread by people) mode of dispersal across gaps by the species. 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 reproduction 2

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by vegetative propagules (e.g. bulbils, turions, pieces of rhizomes, etc.) is documented as a natural (not spread by people) mode of dispersal across gaps by the species. For aquatic species viable plant fragments may be treated as vegetative propagules.

- D. Significant reproduction by seeds (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 abundant reproduction by vegetative propagules (e.g. bulbils, turions, pieces of rhizomes, etc.) is documented as a natural (not spread by people) mode of dispersal across gaps by the species. For aquatic species viable plant fragments may be treated as vegetative propagules. 4
- U. Unknown

Score

| |
|---|
| 2 |
|---|

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Vigorous vegetative spread. Appears able to reproduce from fragments of stolons carried by floodwaters but has no specialized vegetative propagules. Often high degree of seed sterility reported, although one study did find some germinating seeds of *L. nummularia* from flood debris samples.

Sources of information:

Czarapata 2005; Ray, 1956; Salisbury, 1976; Salisbury, 1978; Bittrich & Kadereit, 1988; Mack, 1991; Hughes, & Cass. 1997; Mehrhoff et al., 2004; author's (Glenn's) personal observations.

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

| |
|---|
| 2 |
|---|

Documentation:

Identify dispersal mechanisms:

Average seed mass of .00005 grams; if viable seeds produced, potential for transport by water. Seeds of *L. nummularia* have been observed from flood debris samples. Possible that plant might be able to be spread long distance via vegetative propagules but this has not been confirmed.

Sources of information:

Salisbury, 1974; Hughes & Cass. 1997; Mehrhoff et al., 2004; Gravuer, 2006.

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

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U. Unknown

Score

Documentation:
 Identify dispersal mechanisms:
 Offered for sale since the 1800s and currently widely sold. Recently tested for weed suppressive groundcovers for use along roadsides and landscapes in Suffolk and Tompkins Cos. Mehrhoff et al. (2004) suggests there is potential for indirect dispersal by humans.
 Sources of information:
 Mack, 1991; Mehrhoff, 2004; Eom et al., 2005; Gravuer, 2006.

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, shade tolerant, fast growing.
 Sources of information:
 Mehrhoff, 2004; Gravuer, 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 smothering mats.
 Sources of information:
 Mehrhoff et al., 2004; Gravuer, 2006.

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:
 Seed production low but studies not done on germination or regeneration requirements. Germinating seeds have been observed from flood debris samples.
 Sources of information:
 Ray, 1956; Salisbury, 1978; Bittrich & Kadereit, 1988; Hughes & Cass, 1997; Mehrhoff et al., 2004; Gravuer, 2006.

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

- A. No 0

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- B. Yes 3
 U. Unknown

Score 3

Documentation:

Species:

Lysimachia vulgaris scored High

Total Possible 22

Section Two Total 16

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: “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 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 2

Documentation:

Identify reason for selection, or evidence of weedy history:

Has been reported to occur in natural areas with few other invasives (Hilty, 2006) but others (e.g., Kennay & Fell, 1990) report it is not a problem in high-quality habitats. Known to invade high quality wetlands in NY with few other invasive plants but more commonly is in disturbed sites (NYNHP botanists). *L. nummularia* not seen in NY with > 1/4 acre coverage, but have seen occurrences that large outside of NY and all were disturbed sites (e.g. Rock Creek Park, DC (Lundgren pers. comm).

Sources of information:

Kennay & Fell, 1990; Hilty, 2006; Gravuer, 2006; S. Young, K. Smith and J. Lundgren (NYNHP) pers. comm.

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 two or more of the habitats given at A2.3, with at least one a natural habitat. 1
 C. Known to occur in three or more of the habitats given at A2.3, with at least two a natural habitat. 2
 D. Known to occur in four or more of the habitats given at A2.3, with at least three a natural habitat. 4
 E. Known to occur in more than four of the habitats given at A2.3, with at least four a natural habitat. 6
 U. Unknown

Score 6

Documentation:

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

See A2.3. Occurs in 4 natural habitats.

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Sources of information:

Mehrhoff et al., 2004; Gravuer, 2006; Brooklyn Botanic Garden, 2008.

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:

Occurs in undisturbed wetlands in NY but more commonly is found in disturbed areas.

Sources of information:

Mehrhoff et al., 2004; Czarapata, 2005; Gravuer, 2006; S. Young NYNHP Field Form Database; K. Smith and J. Lundgren (NYNHP) pers. comm.

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

Documentation:

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

Southern Europe and temperate Asia.

Sources of information:

Gravuer, 2006; Brooklyn Botanic Garden, 2008.

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

Score

Documentation:

Identify states and provinces invaded:

Reported throughout all states in the Northeast & Canada.

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

U.S.D.A., 2008.

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

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- 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

Documentation:
 Describe distribution:
 All PRISMs; see A1.1.
 Sources of information:
 Weldy & Werier, 2005; Brooklyn Botanic Garden, 2008.

Total Possible
 Section Three Total

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:
 Indications that seeds that set are largely inviable and those that are viable are short-lived, with "transient to short term persistence (Peat & Fitter, 2006). There are no specialized vegetative propagules. Need more information to answer this question.
 Sources of information:
 Ray, 1956; Salisbury, 1978; Bittrich & Kadereit. 1988; McDonald et al. 1996; Hughes & Cass. 1997; Gravuer, 2006; Peat & Fitter, 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
- D. Any plant part is a viable propagule 3
- U. Unknown

Score

Documentation:
 Describe vegetative response:
 Creeping stolons root at nodes.
 Sources of information:
 Salisbury, 1976; Mehrhoff et al., 2004; Gravuer, 2006.

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 2

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- effort (pulling, cutting and/or digging) can eradicate a 1 acre infestation in 1 year (infestation averages 50% cover or 1 plant/100 ft²).
- 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:

Hand pulling can be effective since stolons can be removed, and roots remaining in the soil would not resprout. Prescribed burning can be successful. More research needed on herbicides. Wetland habitats can complicate these approaches due to regulations and physical difficulties.

Sources of information:

Kenny & Fell, 1990; Czarapata, 2005; Gravuer, 2006; D.Schrader & J.Glover pers.comm.

Total Possible

| |
|---|
| 7 |
|---|

Section Four Total

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

Total for 4 sections Possible

| |
|----|
| 84 |
|----|

Total for 4 sections

| |
|----|
| 54 |
|----|

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: 'aurea'.

References for species assessment:

Aronson, M. F. J. et al. 2004. Plant community patterns of low-gradient forested floodplains in a New Jersey urban landscape. *J. Torrey Bot. Soc.* 131: 232-242.

Barnes, R. S. K. et al. 1971. An ecological study of a pool subject to varying salinity (Swanpool, Falmouth). *J. Animal Ecol.* 40: 709-734.

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Bell, D. T. 1974. Studies on the ecology of a streamside forest: composition and distribution of vegetation beneath the tree canopy. *Bull. Torrey Bot. Club* 101: 14-20.

Bittrich, V. & J. Kadereit. 1988. Cytogenetical and geographical aspects of sterility in *Lysimachia nummularia*. *Nordic J. Bot.* 8: 325-328.

Brooklyn Botanic Garden. 2008. AILANTHUS database. [Accessed on October 2, 2008.]

Czarapata, E.J. 2005. Invasive plants of the Upper Midwest. University of Wisconsin Press, Madison. 215 pp.

Eom, S. H. et al. 2005. Evaluation of herbaceous perennials as weed suppressive groundcovers for use along roadsides or in landscapes. *J. Environ. Hort.* 23: 198-203.

Gaudet, C. L. & P. A. Keddy. 1995. Competitive performance and species distribution in shortline plant communities: A comparative approach. *Ecology* 76: 280-291.

Gravuer, K. 2006. *Lysimachis nummularia*. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer. <www.natureserve.org>. [Accessed on October 2, 2008.]

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Citation: This NY ranking form may be cited as: Jordan, M.J., G. Moore and T.W. Weldy. 2008. 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. Note that the order of authorship is alphabetical; all three authors contributed substantially to the development of this protocol.

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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