NEW YORK
NON-NATIVE PLANT INVASIVENESS RANKING FORM

Scientific name: Persicaria nepalensis (Meisn.) H. Gross (=Polygonum nepalense Meisn. USDA Plants Code: PONE9
Common names: Nepal smartweed
Native distribution: Asia, tropical Africa
Date assessed: December 2, 2010
Assessors: Gerry Moore
Reviewers: LIISMA SRC
Date Approved: 10 January 2011 Form version date: 10 July 2009

New York Invasiveness Rank: Unknown (fewer than 70 total points assessed)

<table>
<thead>
<tr>
<th>Status of this species in each PRISM:</th>
<th>Current Distribution</th>
<th>PRISM Invasiveness Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adirondack Park Invasive Program</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>2 Capital/Mohawk</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>3 Catskill Regional Invasive Species Partnership</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>4 Finger Lakes</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>5 Long Island Invasive Species Management Area</td>
<td>Not Present</td>
<td>Unknown</td>
</tr>
<tr>
<td>6 Lower Hudson</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>7 Saint Lawrence/Eastern Lake Ontario</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>8 Western New York</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
</tbody>
</table>

Invasiveness Ranking Summary

<table>
<thead>
<tr>
<th>Ecological impact</th>
<th>Biological characteristic and dispersal ability</th>
<th>Ecological amplitude and distribution</th>
<th>Difficulty of control</th>
<th>Outcome score</th>
<th>Relative maximum score†</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 (10)</td>
<td>25 (22)</td>
<td>25 (25)</td>
<td>10 (6)</td>
<td>100 (63)</td>
<td>47a</td>
</tr>
</tbody>
</table>

New York Invasiveness Rank § Unknown (fewer than 70.00 total points assessed)

* 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)
- Yes – continue to A1.2
- No – continue to A2.1
A1.2. In which PRISMs is it known (see inset map)?
- Adirondack Park Invasive Program
- Capital/Mohawk
- Catskill Regional Invasive Species Partnership
- Finger Lakes
- Long Island Invasive Species Management Area
- Lower Hudson
- Saint Lawrence/Eastern Lake Ontario
- Western New York
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### Documentation:
Sources of information:
- Brooklyn Botanic Garden, 2010; Weldy & Werier, 2010; T. Rwinski, pers. comm..

#### 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)

<table>
<thead>
<tr>
<th>Not Assessed</th>
<th>Adirondack Park Invasive Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Assessed</td>
<td>Capital/Mohawk</td>
</tr>
<tr>
<td>Not Assessed</td>
<td>Catskill Regional Invasive Species Partnership</td>
</tr>
<tr>
<td>Not Assessed</td>
<td>Finger Lakes</td>
</tr>
<tr>
<td>Unknown</td>
<td>Long Island Invasive Species Management Area</td>
</tr>
<tr>
<td>Not Assessed</td>
<td>Lower Hudson</td>
</tr>
<tr>
<td>Not Assessed</td>
<td>Saint Lawrence/Eastern Lake Ontario</td>
</tr>
<tr>
<td>Not Assessed</td>
<td>Western New York</td>
</tr>
</tbody>
</table>

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

*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)

<table>
<thead>
<tr>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adirondack Park Invasive Program Not Assessed</td>
</tr>
<tr>
<td>Capital/Mohawk                Not Assessed</td>
</tr>
<tr>
<td>Catskill Regional Invasive Species Partnership Not Assessed</td>
</tr>
<tr>
<td>Finger Lakes                  Not Assessed</td>
</tr>
<tr>
<td>Long Island Invasive Species Management Area Not Present</td>
</tr>
<tr>
<td>Lower Hudson                  Not Assessed</td>
</tr>
<tr>
<td>Saint Lawrence/Eastern Lake Ontario Not Assessed</td>
</tr>
<tr>
<td>Western New York               Not Assessed</td>
</tr>
</tbody>
</table>

**Documentation:**
Sources of information:

#### 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.

<table>
<thead>
<tr>
<th>Aquatic Habitats</th>
<th>Wetland Habitats</th>
<th>Upland Habitats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt/brackish waters</td>
<td>Salt/brackish marshes</td>
<td>Cultivated*</td>
</tr>
<tr>
<td>Freshwater tidal</td>
<td>Freshwater marshes</td>
<td>Grasslands/old fields</td>
</tr>
<tr>
<td>Rivers/streams</td>
<td>Peatlands</td>
<td>Shrublands</td>
</tr>
<tr>
<td>Natural lakes and ponds</td>
<td>Shrub swamps</td>
<td>Forests/woodlands</td>
</tr>
<tr>
<td>Vernal pools</td>
<td>Forested wetlands/riparian</td>
<td>Alpine</td>
</tr>
<tr>
<td>Reservoirs/impoundments*</td>
<td>Ditches*</td>
<td>Roadsides*</td>
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</tbody>
</table>

Other potential or known suitable habitats within New York:

**Documentation:**
Sources of information:
- Meier, 2006; Brooklyn Botanic Garden, 2010; Weldy & Werier, 2006.
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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 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

Documentation:
Identify ecosystem processes impacted (or if applicable, justify choosing answer A in the absence of impact information)
Impact on ecosystem processes and system-wide parameters not known.
Sources of information:
Author's pers. comm.

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

Documentation:
Identify type of impact or alteration:
Aggressive growth increases the density of the herb layer.
Sources of information:
Meier, 2006; Troy Weldy, pers. obs.

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

Documentation:
Identify type of impact or alteration:
Impact to community composition not studied; large stands probably at least result in
reduction of numbers of native plants.
Sources of information:
Author's 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:
Studies on impacts to other species not known. Reported to not be eaten by wildlife and possibly poisonous to livestock in Venezuela.
Sources of information:
Meier, 2006

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):
Extensive production of seeds (1000s) on individual plants.
Sources of information:
Brooklyn Botanic Garden, 2010; author's pers. obs.

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 1

Total Possible 10
Section One Total 3
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adaptations)
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

Documentation:
Identify dispersal mechanisms:
Persicaria achenes are eaten by wildlife (e.g., rabbits, waterfowl) and remain viable after passed through the digestive tract.
Sources of information:

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

Documentation:
Identify dispersal mechanisms:
Small seeds could easily be spread indirectly by humans; limited availability of the plant for sale on the internet (although most sites from Europe). Weldy suggest it may be spreading along logging roads.
Sources of information:
Weldy, pers. comm., obs.; author's pers. comm.

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

Documentation:
Evidence of competitive ability:
Fast growing, shade tolerant.
Sources of information:
Meier, 2006; Weldy pers. obs.

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
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U. Unknown

Documentation:
Describe growth form:
Plants can have a rather climbing and somewhat smothering growth habit, the weak stems lying on the surrounding vegetation.
Sources of information:
Meier, 2006.

Score 2

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

Documentation:
Describe germination requirements:
Germination requirements not known.
Sources of information:
Author's pers. comm.

Score U

2.7. Other species in the genus invasive in New York or elsewhere
A. No
   Score 0
B. Yes
   Score 3
U. Unknown

Documentation:
Species:

Score 3

Total Possible 22
Section Two Total 22

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)
   Score 0
B. Large dense stands present in areas with numerous invasive species already present or disturbed landscapes
   Score 2
C. Large dense stands present in areas with few other invasive species present (i.e. ability to invade relatively pristine natural areas)
   Score 4
U. Unknown

Documentation:
**Identify reason for selection, or evidence of weedy history:**
Weldy's observations indicate it likely occurs in areas with few other invasives present and in stands over one quarter an acre.

**Sources of information:**
Troy Weldy, pers. comm.

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

**A.** Not known to invade any natural habitats given at A2.3  
**B.** Known to occur in one natural habitat given at A2.3  
**C.** Known to occur in two natural habitats given at A2.3  
**D.** Known to occur in three natural habitats given at A2.3  
**E.** Known to occur in four or more natural habitats given at A2.3  
**U.** Unknown  

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**Documentation:**  
Identify type of habitats where it occurs and degree/type of impacts:  
See A2.3.  
**Sources of information:**  

### 3.3. Role of disturbance in establishment

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

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**Documentation:**  
Identify type of disturbance:  
Readily establishes in disturbed areas; not known to require anthropogenic disturbance for establishment.  
**Sources of information:**  
Meier, 2006

### 3.4. Climate in native range

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

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<tr>
<td>C</td>
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<td>3</td>
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</table>

**Documentation:**  
Describe what part of the native range is similar in climate to New York:  
Temperate Asia area with climates similar to New York.  
**Sources of information:**  
Meier, 2006

### 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  
**B.** Present as a non-native in one northeastern USA state and/or eastern Canadian province.  
**C.** Present as a non-native in 2 or 3 northeastern USA states and/or eastern Canadian provinces.  
**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.

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<tr>
<td>D</td>
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</table>
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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.  
U. Unknown

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<th>Score</th>
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<td>3</td>
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</tbody>
</table>

Documentation:  
Identify states and provinces invaded:  
CT, MA, NY, PA.  
Sources of information: See known introduced range in plants.usda.gov, and update with information from states and Canadian provinces.  

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 | 2 |

<table>
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<th>Score</th>
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<tbody>
<tr>
<td>2</td>
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</table>

Documentation:  
Describe distribution:  
See A1.1.  
Sources of information:  

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 | 2 |

<table>
<thead>
<tr>
<th>Score</th>
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<tbody>
<tr>
<td>2</td>
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Documentation:  
Identify longevity of seed bank:  
In Persicaria in general most seed germinates within the first year but may remain viable for a few years; no evidence of viability remaining for over ten years.  
Sources of information:  
California Department of Food and Agriculture, 2010.

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 |
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:

References for species assessment:


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.

References for ranking form:


