NEW YORK
NON-NATIVE PLANT INVASIVENESS RANKING FORM

Scientific name:	Phyllostachys Seibold. &Zucc. spp. (includes P. aurea Carrière ex A. Rivière & C. Rivière, P. aureosulcata McClure, P. bambusoides Siebold & Zucc., P. dulcis McClure, P. edulis (Carrière) J. Houz., P. flexuosa A. Rivière & C. Rivière, P. nigra (Lodd. ex Lindl.) Munro, P. viridiglaucescens A. Rivière & C. Rivière USDA Plants Code: PHYLL6
Common names:	Bamboo
Native distribution:	Temperate and subtropical Asia
Date assessed:	February 21, 2010
Assessors:	Gerry Moore
Reviewers:	LIISMA SRC
Date Approved:	March 10, 2010 Form version date: 10 July 2009

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	Restricted	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 (30)	17
2	Biological characteristic and dispersal ability	25 (19)	14
3	Ecological amplitude and distribution	25 (25)	15
4	Difficulty of control	10 (10)	6
	Outcome score	100 (84)[b]	52[a]
	Relative maximum score †		61.90
	New York Invasiveness Rank §	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.

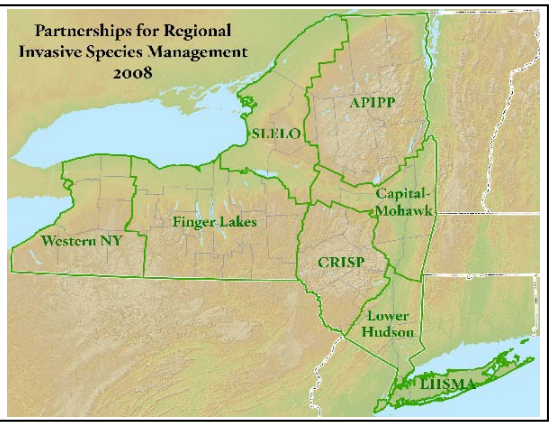
A. DISTRIBUTION (KNOWN/POTENTIAL): Summarized from individual PRISM forms

A1.1. Has this species been documented to persist without cultivation in NY? (reliable source; voucher not required)

- ☒ 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



Documentation: Weldy & Werier (2010) do not include any species of Phyllostachys. The herbarium at BBG has three recently collected (2009) specimens from Nassau County of Phyllostachys that represent non-cultivated material or material that has spread extensively from the original planting. The author has also noted material of Phyllostachys in Queens Co. (Alley Pond Park) that may represent escaped material. Author has also noted it at numerous sites from New Jersey that represent non-cultivated material or material that has spread extensively from the original planting.
Sources of information:
Brooklyn Botanic Garden, 2010; Weldy & Werier, 2010; U.S.D.A., 2010; author's pers. obs.

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):
Brooklyn Botanic Garden, 2010.

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	Restricted
Lower Hudson	Not Assessed
Saint Lawrence/Eastern Lake Ontario	Not Assessed
Western New York	Not Assessed

Documentation:
Sources of information:
Brooklyn Botanic Garden, 2010.

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
☐ Salt/brackish waters	☐ Salt/brackish marshes	☒ Cultivated*
☐ Freshwater tidal	☐ Freshwater marshes	☒ Grasslands/old fields
☐ Rivers/streams	☐ Peatlands	☐ Shrublands
☐ Natural lakes and ponds	☐ Shrub swamps	☒ Forests/woodlands
☐ Vernal pools	☒ Forested wetlands/riparian	☐ Alpine
☐ Reservoirs/impoundments*	☒ Ditches*	☒ Roadsides*
	☐ Beaches and/or coastal dunes	

Other potential or known suitable habitats within New York:

Documentation:
Sources of information:
Stapleton & Barkworth, 2007; Brooklyn Botanic Garden, 2010; author's pers. obs.

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	

Score 3

Documentation:
Identify ecosystem processes impacted (or if applicable, justify choosing answer A in the absence of impact information)
Dense stands clearly reduce light availability, but Gravuer (2008) notes "no mention of specific ecosystem-level impacts found in literature. Gonzalez and DallRosa (2006) apparently produces considerable leaf litter (Gonzalez and DallaRosa 2006), which may have a mild influence on soil nutrient cycling." Regardng fires, stands may also increase the fuel load and could impact fire regimes.
Sources of information:
Gravuer, 2008; U.S. Forest Service FEIS; author's and SRC pers. comm. and obs

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:
Gravuer (2008): "Can form dense stands up to 12-15 m tall (Weakley 2008); in the Florida Invasive Plants Geodatabase (FLInv), about half of documented infestations were rated "dense monoculture" or "dominant cover," with the other half described as "scattered plants or clumps" (FNAI 2008). Infestations alter wildlife habitat (Gonzalez and DallaRosa 2006). Within open forest communities, it appears that infestations would form a new layer of vegetation." Author has noted that it can form solid dense patches with little to nothing growing below it.
Sources of information:
Gravuer, 2008; author's 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	

Score: 7

Documentation:
Identify type of impact or alteration:
Gravuer (2008): "Can form dense, impenetrable monocultures that displace native species (Staples et al. 2002, Gonzalez and DallaRosa 2006)." Author has observed it to form monocultures that significantly reduce the number of native species growing in the community.
Sources of information:
Gonzalez & DallaRosa, 2006; Gravuer, 2008; author's pers. obs.

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): "No mention of disproportionate impacts found in literature. However, leaf litter is believed to affect litter-feeding stream invertebrates (Gonzalez and DallaRosa 2006), so it is possible that stream invertebrates dependent on specific qualities of native species' leaf litter may be disproportionately affected." Specific studies not found by author on impacts to other species or species groups.
Sources of information:
Gonzalez & DallaRosa; Gravuer, 2008; Author's pers. comm.

Total Possible: 30
Section One Total: 17

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 2

Documentation:
Describe key reproductive characteristics (including seeds per plant):
Production of seed not known from the non-native stands. Production of flowers, and thus seed, in Phyllostachys is quite rare. In favorable situations, Phyllostachys can spread well beyond the original plantings; wider dispersal can occur when pieces of the rhizome or stem are transported to new locations.
Sources of information:
Stapleton, 2007; Stapleton & Barkworth, 2007; 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 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 1

Documentation:
Identify dispersal mechanisms:
Seed production extremely rare and without obvious adaptations for long distance dispersal. Long distance dispersal can rarely occur when pieces of the rhizomes or stems are moved.
Sources of information:
Stapleton, 2007; Stapleton & Barkworth, 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 3

Documentation:
Identify dispersal mechanisms:
Phyllostachys species are frequently grown, and probably are the most popular bamboo sold due to lower cost than many others. Could be spread by direct means when it is grown or when soil with viable rhizomes or stems present is moved or dumped.
Sources of information:
Stapleton, 2007; Gravuer, 2008; 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	

Score 6

Documentation:
Evidence of competitive ability:
Perennial, some shade tolerance, ability to grow on nutrient poor soils; fast growth.
Sources of information:
Stapleton & Barkworth, 2007; author's 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
U.	Unknown	

Score 2

Documentation:
Describe growth form:
Forms dense thickets.
Sources of information:
Stapleton & Barkworth, 2007; Gravuer, 2008; author's pers. obs.

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 U

Documentation:
Describe germination requirements:
Regeneration requirements of rhizomes or stems not known for wild material.
Sources of information:
Author's pers. comm.

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

A.	No	0
B.	Yes	3
U.	Unknown	

Score U

Documentation:
Species:
The genus is being treated and thus species information is not applicable. Brooklyn Botanic Garden, 2010; Weldy & Werier, 2010; U.S.D.A. NRCS, 2010.

Total Possible	19
Section Two Total	14

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

Documentation:
Identify reason for selection, or evidence of weedy history:
Stands of greater than 0.25 known from New York (Nassau County) and New Jersey. Some stands from New Jersey occurring with few other invasives present.
Sources of information:
Brooklyn Botanic Garden, 2010; author's pers. obs.

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
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 4

Documentation:
Identify type of habitats where it occurs and degree/type of impacts:
See A2.3.
Sources of information:
Brooklyn Botanic Garden, 2010; author's pers. obs.

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 0

Documentation:
Identify type of disturbance:
Becomes established only after anthropogenic disturbance.
Sources of information:
Brooklyn Botanic Garden, 2010; author's pers. obs.

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:

Phyllostachys occur in temperate Asia with climates similar to New York. It is cultivated in North America as far north as Vancouver and Buffalo.
Sources of information:
Stapleton & Barkworth, 2007; U.S.D.A., 2010

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 3

Documentation:
Identify states and provinces invaded:
DE, KY, MA, MD, NJ, NY, VA, WV, .
Sources of information: See known introduced range in plants.usda.gov, and update with information from states and Canadian provinces.
U.S.D.A. NRCS, 2010; EDDMaps

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 1

Documentation:
Describe distribution:
See A1.1.
Sources of information:
Brooklyn Botanic Garden, 2010; Weldy & Werier, 2010; U.S.D.A., 2010.

Total Possible	25
Section Three Total	15

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 0

Documentation:
Identify longevity of seed bank:
Doubtful that rhizomes or stems could remain viable for more than a year. Seed production not known for non-native populations and very rare in native populations; thus, length of viability not relevant.
Sources of information:
Gravuer, 2008; author's pers. comm.

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 2

Documentation:
Describe vegetative response:
Extensive underground root system.
Sources of information:
Stapleton & Barkworth, 2007; author's pers. obs.

4.3. Level of effort required

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

Score 4

Documentation:
Identify types of control methods and time-term required:
Gravuer (2008): "In natural areas, the control method of choice would likely be repeated cutting/mowing (when infestations are small or herbicides cannot be used) or the "cut stump" method of cutting and then applying an herbicide (when infestations are larger and herbicides are permitted). Cutting/mowing is relatively labor-intensive; it must be repeated several times throughout the growing season, and monitoring and re-treatment are necessary for several growing seasons until the energy reserves in the rhizomes are exhausted (SE-EPPC 2003). Cut stump" treatments are also likely to require multiple visits, as single applications of herbicides do not tend to effectively control this species (Czarnota and Derr 2007). Both the cutting/mowing and cut stump treatment methods require follow-up, such that the control program will almost certainly require more than two years, but probably not more than 10 years. The effective herbicide with the least impact on co-occurring natives appears to be glyphosate; however, as noted by the Center for Aquatic and Invasive Plants (2008), glyphosate is a non-selective systemic herbicide that may kill non-target, partially sprayed plants. Still, if applied carefully to cut stumps, glyphosate would probably harm co-occurring natives less than 25% of the time. Damage to natives from cutting/mowing is assumed to be below this threshold as well." Presence in wetlands will require permits for

removal activities.
Sources of information:
Gravuer, 2008

Total Possible	10
Section Four Total	6
Total for 4 sections Possible	84
Total for 4 sections	52

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:

Brooklyn Botanic Garden. 2010. AILANTHUS database. [Accessed February 21, 2010].

Center for Aquatic and Invasive Plants. 2008. Golden bamboo: Phyllostachys aurea. University of Florida, Institute of Food and Agricultural Sciences (IFAS). Online. Available: <plants.ifas.ufl.edu/node/324> [Accessed February 21, 2010.] .

Czarnota, M. and J. Derr. 2007. Controlling bamboo (Phyllostachys spp.) with herbicides. Weed Technology 21: 80-83.

Dawson, W., A. S. Mndolwa, D. F. R. P. Burslem, and P. E. Hulme. 2008. Assessing the risks of plant invasions arising from collections in tropical botanical gardens. Biodiversity and Conservation 17: 1979-1995.

Edgar, E. and H. E. Connor (with contributions from W. R. Sykes and M. I. Dawson). 2000. Flora of New Zealand volume 5: Gramineae. Manaaki Whenua Press, Lincoln, New Zealand.

EDDMaps. Early Detection and Maping System. Bugwood Network. http://www.eddmaps.org/distribution/usstate.cfm?sub=3063 [Accessed March 10, 2010]

Gonzalez, L. and J. DallaRosa. 2006. The quiet invasion: A guide to the invasive plants of the Galveston Bay area. Houston Advanced Research Center and Galveston Bay Estuary Program. Online. Available: <www.galvbayinvasives.org>[Accessed February 21, 2010.]

Gravuer, K. 2008. Phyllostachys aurea. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer <www.natureserve.org>.[Accessed February 21, 2010].

Stapleton, M.A. 2007. Bambuseae. Pp. 15-16 in (Barkworth et al. eds.) Flora North America Vol 24. Oxford University Press, New York. 908 pp.

Stapleton, M.A. and M.E. Barkworth. 2007 Phyllostachys. Pp. 25-27 in (Barkworth et al. eds.) Flora North America Vol 24. Oxford University Press, New York. 908 pp.

United States Department of Agriculture, National Resources Conservation Service. 2010. The PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana. < http://plants.usda.gov/> [Accessed].
Weakley, A. S. 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas. Working Draft of 7 April 2008. University of North Carolina Herbarium (NCU), North Carolina Botanical Garden, University of North Carolina at Chapel Hill. Online. Available: <herbarium.unc.edu/flora.htm> [Accessed February 21, 2010.].

United States Forest Service.
http://www.fs.fed.us/database/feis/plants/graminoid/phyaur/all.html#FIRE%20EFFECTS%20AND%20MANAGEMENT [accessed March 10, 2010]

Weldy, T. and D. Werier. 2010. New York Flora Atlas. [S.M. Landry, K.N. Campbell, and L.D. Mabe (original application development), Florida Center for Community Design and Research. University of South Florida]. New York Flora Association, Albany, New York. <www.newyork.plantatlas.usf.edu> [Accessed February 21, 2010.].

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:

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