NEW YORK
NON-NATIVE PLANT INVASIVENESS RANKING FORM

Scientific name:	Ligustrum obtusifolium	USDA Plants Code: LIOB
Common names:	Border privet	
Native distribution:	Japan	
Date assessed:	February 19, 2009	
Assessors:	Steve Glenn, Gerry Moore	
Reviewers:	LIISMA SRC	
Date Approved:	Feb. 25, 2009	Form version date: 22 October 2008

New York Invasiveness Rank: High (Relative Maximum Score 70.00-80.00)

Distribution and Invasiveness Rank (*Obtain from PRISM invasiveness ranking form*)

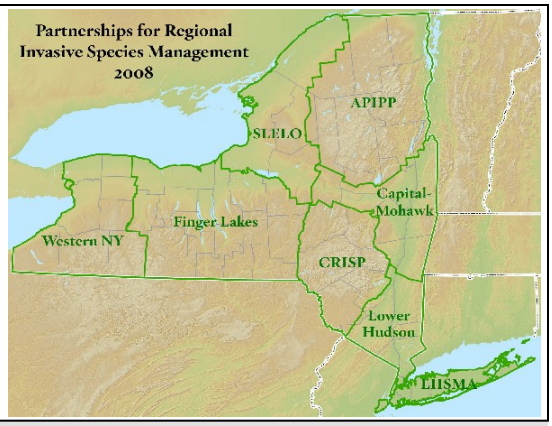
	Status of this species in each PRISM:	Current Distribution	PRISM Invasiveness Rank
1	Adirondack Park Invasive Program	Not Assessed	Not Assessed
2	Capital/Mohawk	Not Assessed	Not Assessed
3	Catskill Regional Invasive Species Partnership	Not Assessed	Not Assessed
4	Finger Lakes	Not Assessed	Not Assessed
5	Long Island Invasive Species Management Area	Widespread	High
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 (25)	21
3	Ecological amplitude and distribution	25 (25)	25
4	Difficulty of control	10 (10)	6
	Outcome score	100 (90)[b]	69[a]
	Relative maximum score †		76.67
	New York Invasiveness Rank §	High (Relative Maximum Score 70.00-80.00)	

* 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

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:

Sources of information:
Weldy & Werier, 2009; Brooklyn Botanic Garden, 2009.

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):
Well established in the Long Island PRISM. Brooklyn Botanic Garden, 2009.

If the species does not occur and is not likely to occur with any of the PRISMs, then stop here as there is no need to assess the species.

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

Documentation:
Sources of information:
Brooklyn Botanic Garden, 2009.

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:
Forest edges, open woods, sandy ericaceous-oak woods, along streams.

Documentation:
Sources of information:
Maybury, 2006; Brooklyn Botanic Garden, 2009; authors' pers. obs.

B. INVASIVENESS RANKING

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)
No specific studies on the impact of ecological processes known. Certainly large stands reduce light availability. This species can form exceptionally large stands; further studies needed to determine if there are additional impacts to ecosystem processes and system wide parameters that have yet to be documented.
Sources of information:
Maybury, 2006; authors' pers. 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:
Ligustrum obtusifolium can form exceptionally dense thickets eliminating layers below. No evidence of major alteration of structure.
Sources of information:
Batcher, 2000; authors' 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:
Ligustrum obtusifolium may outcompete native shrubs in regenerating communities and remain persistent in these areas thus resulting in significant reduction in the populations sizes of these native species. No evidence for extirpation of native species.
Sources of information:
Batcher, 2000; authors' 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:
Studies on impacts to other species groups not done (Maybury, 2006). Flowers are pollinated by many insects (authors' obs.). Genus banned in New Zealand where it has been reported to cause asthma and eczema in some people (Swearingen et al., 2002).
Sources of information:
Swearingen et al, 2002; Maybury, 2006; authors' pers. obs.

Total Possible 30
Section One Total 17

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode and rate of reproduction (provisional thresholds, more investigation needed)

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):
Ligustrum species in general resprout readily and produce fairly abundant seed with high viability, but may produce less fruit in low-light situations.

Sources of information:
Maybury, 2006; authors' 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 4

Documentation:
Identify dispersal mechanisms:
Birds consume fruits and spread seeds long distances; vegetative spread through root suckering.
Sources of information:
Batcher, 2000; Maybury, 2006; authors' pers. obs. .

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 2

Documentation:
Identify dispersal mechanisms:
Formerly sold as an ornamental landscape plant and used for waste landfill remediation. Today L. obtusifolium is not widely sold. Disposal of yard waste and highway maintenance may transfer seeds.
Sources of information:
Kim et al., 2005; Maybury, 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 6

Documentation:
Evidence of competitive ability:
Perennial, grows on infertile soils; well-adapted to a variety of habitat conditions, especially

to various levels of irradiance and infertile soils. Ligustrum spp. leaves are high in phenolic compounds that defend against herbivory.
Sources of information:
Batcher, 2000; Maybury, 2006; authors' 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:
Can form dense shrub-layer thickets.
Sources of information:
Batcher, 2000; Maybury, 2006; authors' 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 3

Documentation:
Describe germination requirements:
Ligustrum obtusifolium seen germinating readily. Germination rates have been variously reported as high as 80+%.
Sources of information:
Dirr & Heuser 1987; Batcher, 2000; authors' pers. obs.

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

A. No 0
B. Yes 3
U. Unknown

Score 0

Documentation:
Species:
Ligustrum ovalifolium, and L. vulgare are reported escaping from cultivation in CT, NJ, NY, and New England, but with declared invasive status.
Tomaino, 2004; Brooklyn Botanic Garden, 2009; Mehrhoff et al., 2009; Weldy & Werier, 2009;

Total Possible 25
Section Two Total 21

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:
Ligustrum obtusifolium was found invading an old field succession site in Illinois- the field had an average of more than 6,082 plants per ha (2.5 acres). Large stands found with few other invasive species present in New York metropolitan area, although oftentimes it is found with other invasive plant species present.
Sources of information:
Batcher, 2000; Maybury, 2006; authors' 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 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.
Sources of information:
Brooklyn Botanic Garden, 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 4

Documentation:
Identify type of disturbance:
Readily establishes in disturbed areas, but capable of invading high quality forests.
Sources of information:
Maybury, 2006; authors' 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:
Japan.
Sources of information:
Batcher, 2000.

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 4

Documentation:
Identify states and provinces invaded:
CT, DC, DE, IL, IN, KY, MA, MD, MI, NH, NJ, NY, OH, PA, RI, VA, VT.
Sources of information: See known introduced range in plants.usda.gov, and update with information from states and Canadian provinces.
U.S.D.A., 2009.

3.6. Current introduced distribution of the species in natural areas in 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 4

Documentation:
Describe distribution:
See A1.1.
Sources of information:
Weldy & Werier, 2009; Brooklyn Botanic Garden, 2009.

Total Possible 25
Section Three Total 25

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:
Panetta (2009): "Seeds of both broad-leaved and small-leaved privets appear to be relatively short-lived. In the first trial, there was a flush of emergence in the first few months (winter and spring) following sowing, with no further seedlings emerging after 7 months for broad-leaved privet and 5 months for small-leaved privet." Rehder (1922) reported that Ligustrum seeds could be propagated from seeds sown in the fall and noted that some would not germinate until the following season. No evidence that seeds persist for one year or more. Daniel Ryniec, curator of BBG's lilac collection, has made similar observations in the closely related lilacs (Syringa).
Sources of information:
Rehder, 1922; Penetta, 2009.

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:
Ligustrum spp. grow readily from root suckering and stump sprouts.
Sources of information:
Batcher, 2000; Maybury, 2006; authors' 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:
The potential for large-scale restoration of unmanaged natural areas or wildlands infested with Ligustrum spp. is probably low. Restoration potential for managed natural areas or wildlands infested Ligustrum spp. is probably moderate. If attacked during the early stages of colonization, the potential for successful management is high.

Mechanical Controls: Mowing and cutting are appropriate for small populations, repeated

mowing or cutting will control the spread of Ligustrum spp., but may not eradicate it. Ligustrum spp. can be effectively controlled by the manual removal of young seedlings. Plants should be pulled as soon as they are large enough to grasp but before they produce seeds. Seedlings are best pulled after a rain when the soil is loose. Larger stems (up to 6 cm in diameter) can be removed using a weed wrench or similar uprooting tools. The entire root must be removed since broken fragments may resprout. One study found the use of goats to control privet works well.

Biological Controls: Ligustrum spp. have no known biological controls, although a few pathogens are known to attack them in North America. The larva of the privet moth, Brahmaea wallichii (Brahmaeidae) is a specialist feeder of the privet (Konno et al., 2001), but no research as yet on its use for bio-control.

Herbicidal Control: Foliar Spray Method: This method may be effective for large thickets of Ligustrum spp. where risk to non-target species is minimal. The ideal time to treat is while plants are in leaf in late autumn or early spring but when many native species are dormant.

Glyphosate- a number of concentrations have been used successfully. A 2% solution of glyphosate and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves; for a handgun sprayer, 1 liter Roundup and 100 mls of a surfactant per 100 liters of water (1% solution); for a backpack sprayer, the recommendation is 100 ml Roundup and 20 mls of a surfactant per 10 liters of water.
Triclopyr- a 2% solution of triclopyr and water plus a 0.5% non-ionic surfactant, sprayed to thoroughly wet all leaves.
Metsulfuron- for a handgun sprayer, 35 g metsulfuron and 100 mls of a surfactant per 100 liters of water; for a backpack sprayer, the recommendation is 5 g metsulfuron and 10 mls of a surfactant per 10 liters of water. Metsulfuron methyl was identified as the most cost-effective herbicide in an experimental treatment comparing metsulfuron methyl, triclopyr ester and 2,4-D.

Cut Stump Method: This control method should be considered when treating individual shrubs or where the presence of desirable species precludes foliar application. Immediately after cutting stems at or near ground level, apply a 25% solution of glyphosate and water or triclopyr and water to the cut stump, being careful to cover the entire surface. Effectiveness of the herbicide is increased if holes are cut in the top of the freshly felled stump, to hold the herbicide in for better absorption by plant.

Basal Bark Method: Apply a mixture of 25% triclopyr and 75% horticultural oil to the basal parts of the shrub to a height of 30-38 cm (12-15 in) from the ground. Thorough wetting is necessary for good control; spray until run-off is noticeable at the ground line. Researchers have killed standing Ligustrum trees by drilling downward-sloping 20 mm wide holes 5 cm into the trunk at no greater than 5 cm spacing around the trunk, and filling the holes with a stump paint-herbicide mix.

Prescribed Burning: Studies on other Ligustrum species have found that burning top-kills and eliminates them over time, and that burning is effective if done annually.

Sources of information:
Batcher, 2000; Konno et al., 2001.

Total Possible	10
Section Four Total	6
Total for 4 sections Possible	90

Total for 4 sections 69

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: 'Constitution', 'Dart's Perfection', L. obtusifolium var. regelianum,

References for species assessment:

Batcher, M. S. 2000. Element stewardship abstract for Ligustrum spp. - Privet. The Nature Conservancy, Arlington, VA.

Brooklyn Botanic Garden. 2009. AILANTHUS database. [Accessed on 19 February 2009].

Dirr, M. A. and C. W. Heuser. 1987. The reference manual of woody plant propagation: from seed to tissue culture. Varsity Press Inc., Athens, Georgia. 239 pp.

Kai, K., T. Horiuchi, & N. Nomoto. 1991. Seasonal behavior of leaves of the semideciduous shrub Ligustrum obtusifolium. Japanese Journal of Ecology (Tokyo). 41(2):73-82.

Kim, K. D., & E. J. Lee. 2005. Potential tree species for use in the restoration of unsanitary landfills. Environmental Management. 36(1):1-14.

Konno, K., S. Okada, & C. Hirayama. 2001. Selective secretion of free glycine, a neutralizer against a plant defense chemical, in the digestive juice of the privet moth larvae. Journal of Insect Physiology. 47(12):1451-1457.

Maybury, K. 2006. Ligustrum obtusifolium. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer. <www.natureserve.org>. [Accessed on 19 February 2009].

Mehrhoff, L. J., J. A. Silander, Jr., S. A. Leicht, E. S. Mosher and N. M. Tabak. 2003.
IPANE: Invasive Plant Atlas of New England. Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT, USA. [Accessed on 19 February 2009].

Panetta, D. 2009. Ecology and management of environmental weeds in south-eastern Queensland. <cbit.uq.edu.au/biocontrol/pest_plant_management/weeds_in_seq.htm>. [Accessed 19 February 2009].

Rehder, A. H. 1922. Ligustrum. Pp. 1859-1862 in L. H. Bailey, The Standard Cyclopedia of Horticulture. Macmillan Co., London. Vol. IV. 2421. pp.

Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker (2002). Privets. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service. <nps.gov/plants/alien/pubs/midatlantic/ligu.htm> [Accessed February 11, 2009.].
Tomaino, A. 2004. Ligustrum vulgare. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer. <www.natureserve.org>. [Accessed on 19 February 2009].

United States Department of Agriculture, National Resources Conservation Service. 2009. The PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana [Accessed on 19 February 2009].

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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.

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