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

Scientific name: Aegopodium podagraria L. USDA Plants Code: AEPO

Common names: Bishop's goutweed
Native distribution: Europe and Asia

Date assessed: March 1, 2008; October 2, 2008; revised 01-17-2013

Assessors: Jinshuang Ma, Gerry Moore; revision Marilyn Jordan and SRC

Reviewers: LIISMA SRC

Date Approved: 10-08-2008; 01-17-2013 Form version date: 28 November 2012

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

Dis	<b>Distribution and Invasiveness Rank</b> (Obtain from PRISM invasiveness ranking form)				
			PRISM		
	Status of this species in each PRISM:	Current Distribution	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	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		

Inv	asiveness Ranking Summary	Total (Total	Total	
(see	details under appropriate sub-section)	Answered*) Possible		
1	Ecological impact	40 ( <u>20</u> )	14	
2	Biological characteristic and dispersal ability	25 ( <u>25</u> )	16	
3	Ecological amplitude and distribution	25 ( <u>25</u> )	15	
4	Difficulty of control	10 ( <u>10</u> )	6	
	Outcome score	100 ( <u>80</u> ) <sup>b</sup>	54 <sup>a</sup>	
	Relative maximum score †		63.75	
	New York Invasiveness Rank (for natural areas) §	Moderate (Relative Maximum Score 50.00-69.99		

<sup>\*</sup> 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

	s this species been documented to persist without	Partnerships for Regional
cultivatio	n in NY? (reliable source; voucher not required)	Invasive Species Management
	Yes – continue to A1.2	2008
	No – continue to A2.1	SLEIO
A1.2. In	which PRISMs is it known (see inset map)?	
$\boxtimes$	Adirondack Park Invasive Program	Capital
$\boxtimes$	Capital/Mohawk	Finger Lakes Mohawk
$\boxtimes$	Catskill Regional Invasive Species Partnership	Western NY CRISP
$\boxtimes$	Finger Lakes	CROS
	Long Island Invasive Species Management Area	Lower
	Lower Hudson	Hudson
	Saint Lawrence/Eastern Lake Ontario	Liisma
	Western New York	Star Distance of the Star Star Star Star Star Star Star Star

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Document Sources of in	nformation:			
	erier, 2005; Brooklyn Bo	otanic Garden, 2008. s species will occur and pers	ist outside of cultivation a	iven the climate
		rom PRISM invasiveness rar		iven the cimate
Not Assessed	Adirondack Park In		<i>S</i> - <i>)</i>	
Not Assessed	Capital/Mohawk	8		
Not Assessed	•	Invasive Species Partnersh	nip	
Not Assessed	Finger Lakes	1	1	
Very Likely	<u> </u>	ve Species Management A	Area	
Not Assessed	Lower Hudson			
Not Assessed	Saint Lawrence/Ea	stern Lake Ontario		
Not Assessed	Western New York	K		
Document	ation:			
	nformation (e.g.: distribu erier, 2005; Brooklyn Bo	ution models, literature, expeotanic Garden, 2008.	ert opinions):	
If the species	does not occur and	is not likely to occur in	any of the PRISMs, t	then stop here
a	s there is no need to	assess the species. Rai	nk is "Not Assessable.	"
A22 What	is the current distribution	n of the species in each PRIS	SM2 (abtain rank from DD)	ICM impaginanaga
ranking forn		ii of the species in each i Kik	5W1: (Obtain Tank Jrom 1 Ki	SWI invasiveness
remains join	<i>is j</i>		Distrib	oution
Adirondack	x Park Invasive Progra	nm	Not As	
Capital/Mo	•		Not As	
	gional Invasive Specie	es Partnership	Not As	
Finger Lak		1	Not As	
•	d Invasive Species Ma	nagement Area	Wides	spread
Lower Hud	_	8	Not As	
Saint Lawr	ence/Eastern Lake On	tario	Not As	sessed
Western No	ew York		Not As	sessed
Document	ation:			
Sources of in	nformation:			
Weldy & W	erier, 2005; Brooklyn Be	otanic Garden, 2008.		
		vn suitable habitats within Naman management. Managed		
Aquatic Hab		Wetland Habitats	Upland Habitats	i ali asterisk.
	orackish waters	Salt/brackish marsh	<u>*                                      </u>	•
<b>=</b>	water tidal	Freshwater marshes	=	
	rs/streams	Peatlands	Shrublands	
	ral lakes and ponds	Shrub swamps	∑ Forests/wo	odlands
	al pools	Forested wetlands/ri		
Reser	rvoirs/impoundments*	<ul><li>☑ Ditches*</li><li>☐ Beaches and/or coast</li></ul>	⊠ Roadsides*	•
Other potent	ial or known suitable ha	bitats within New York:	iai dunes	
Document	ation:			
Sources of in				
	04: Brooklyn Botanic Ga	arden 2008		

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**B. INVASIVENESS RANKING**Ouestions apply to areas similar in climate and habitats to New York unless specified otherwise

Questic	ons apply to areas similar in climate and habitats to New York unless specified other	erwise.
1. E	COLOGICAL IMPACT	
regime,	pact on Natural Ecosystem Processes and System-Wide Parameters (e.g. fire, geomorphological changes (erosion, sedimentation rates), hydrologic regime, t and mineral dynamics, light availability, salinity, pH)  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	0
B.	for >100 years.  Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on	3
C.	soil nutrient availability) Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams	7
D.	or coastlines, reduces open water that are important to waterfowl) Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species	10
U.	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)  Unknown	10
0.	Score	U
	Documentation:  Identify ecosystem processes impacted (or if applicable, justify choosing answer A in the absence of impact information)  Fellows (2006): "Despite being well-established in the United States since at least the mid- 1800s (Mehrhoff, 2003; Garske & Schimpf, 2005) no reports of impacts on ecosystem processes or system-wide parameters were found. Therefore assume impacts are relatively insignificant." However, detailed ecological studies are lacking.  Sources of information:  Make the first al., 2004. Carrier & Schimpf, 2005. Fellows, 2006.	
1.2 Im	Mehrhoff et al., 2004; Garske & Schimpf, 2005; Fellows, 2006.  pact on Natural Community Structure	
A.	No perceived impact; establishes in an existing layer without influencing its structure	0
В.	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
13 Im	Documentation: Identify type of impact or alteration: Greatly increases the density in existing herb layer. Can also create an herb layer when one is absent. Also can inhibit the establishment of native tree species (Garske & Schimpf, 2005). Sources of information: Garske & Schimpf, 2005; Fellows, 2006; author's (Moore's) personal observations. pact on Natural Community Composition	,

	bact on Matural 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	3
	native species in the community)	
C.	Significantly alters community composition (e.g., produces a significant reduction in the	7
	population size of one or more native species in the community)	
D.	Causes major alteration in community composition (e.g., results in the extirpation of one or	10

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several native species, reducing biodiversity or change the community composition towards species exotic to the natural community)
Unknown

U.		core	7
	Documentation:	2010	/
	Identify type of impact or alteration:		
	Greatly crowds out native species where established (Fewless, 2003) and shown to greatly		
	reduce diversity in the ground layer (Garske & Schimpf, 2005). Author (Moore) has noted the in woodlands in Prospect Park in Brooklyn.	ais	
	Sources of information:		
	Fewless, 2003; Garske & Schimpf, 2005; author's (Moore's) personal observations.		
1.4. In	npact on other species or species groups (cumulative impact of this species on t	he	
anima	ls, fungi, microbes, and other organisms in the community it invades. Examples	3	
includ	e reduction in nesting/foraging sites; reduction in habitat connectivity; injurious	S	
compo	onents such as spines, thorns, burrs, toxins; suppresses soil/sediment microflora	,	
interfe	res with native pollinators and/or pollination of a native species; hybridizes wit	h 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		
	S	core	U
	Documentation:		
	Identify type of impact or alteration:		
	Fellows (2006) assumes that "any impacts are not significant." However, studies are lacking	3.	
	Sources of information: Fellows, 2006.		
	Total Poss	sible	20
	Section One T	`otal	14
2. 1	BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY		
	ode and rate of reproduction		
Α.	· · · · · · · · · · · · · · · · · · ·	al	0
	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	nent	
D	here. Limited reproduction (fewer than 10 viable seeds per plant; if seed viability is not known, the	an	1
В.	maximum seed production is less than 100 seeds per plant, it seed viability is not known, the		1
	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.		
C.		n	2
	maximum seed production is less than 1000 seeds per plant) – OR limited reproduction by	1	
	vegetative propagules (e.g. bulbils, turions, pieces of rhizomes, etc.) is documented as a natu (not spread by people) mode of dispersal across gaps by the species. For aquatic species vial		
	plant fragments may be treated as vegetative propagules.	JIC	
D.			4
٥.	known, then maximum seed production reported to be greater than 1000 seeds per plant) –(		•
	abundant reproduction by vegetative propagules (e.g. bulbils, turions, pieces of rhizomes, et		
	is documented as a natural (not spread by people) mode of dispersal across gaps by the spec	ies.	
	For aquatic species viable plant fragments may be treated as vegetative propagules.		

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U.	Unknown	
	Score	1
	Documentation: Describe key reproductive characteristics (including seeds per plant): Seed production limited (seed packets are sold) but has extensive vegetative asexual spread. The plant doesn't appear to readily establish by seed since it does not escape in landscape settings by increases primarily by vegetative growth. Sources of information: Voss, 1985; Mehrhoff et al., 2004; Garske & Schimpf, 2005; Fellows, 2006; authors' personal observations.	
	ate potential for long-distance dispersal (e.g. bird dispersal, sticks to animal hair,	
buoyant A.	fruits, pappus for wind-dispersal)  Does not occur (no long-distance dispersal mechanisms)	0
В.	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	1
	Documentation:	
	Identify dispersal mechanisms:  Seed set is scarce and small seeds lack adaptations for long distance dispersal. Rhizomes might be able to be dispersed long distances but data are lacking.  Sources of information:	
	Mehrhoff et al., 2004; Fellows, 2006; author's (Moore's) personal observations.	
	tential to be spread by human activities (both directly and indirectly – possible	
highwa	isms include: commercial sales, use as forage/revegetation, spread along ys, transport on boats, contaminated compost, land and vegetation management	
	ent such as mowers and excavators, etc.)  Does not occur	0
A. B.	Low (human dispersal to new areas occurs almost exclusively by direct means and is infrequent or inefficient)	0 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	3
	Documentation:	3
	Identify dispersal mechanisms: Species is commercially sold and planted as a ground cover. Indirect spread can occur through disposal of yard and lawn waste. Sources of information:	
	Voss, 1985; Mehrhoff et al., 2004; Garsek & Schimpf, 2005.	
2.4. Ch	aracteristics that increase competitive advantage, such as shade tolerance, ability	
	on infertile soils, perennial habit, fast growth, nitrogen fixation, allelopathy, etc.	
A. R	Possesses no characteristics that increase competitive advantage  Possesses one characteristic that increases competitive advantage	0

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	C. U.	Possesses two or more characteristics that increase competitive advantage Unknown		6
	О.		Score	6
		Documentation: Evidence of competitive ability: Shade tolerant, perennial, grows on infertile soils. Sources of information: Fewless, 2003; Garske & Schimpf, 2005; Fellows, 2006.		
		owth vigor		
	A.	Does not form thickets or have a climbing or smothering growth habit		0
	В. U.	Has climbing or smothering growth habit, forms a dense layer above shorter vegetation, for dense thickets, or forms a dense floating mat in aquatic systems where it smothers other vegetation or organisms  Unknown	orms	2
			Score	2
		Documentation:  Describe growth form:  Can exhibit smothering growth, described as "dense mats" by Fellows (2006).  Sources of information:  Mehrhoff et al., 2004; Garske & Schimpf, 2005; Fellows, 2006; author's (Moore's) person observations.	ıal	_
2.6.	Ger	mination/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	S	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: While seed production is rare and species requires open soil to germinate (Fellows, 2006; Garske & Schimpf, 2005), it can readily regenerate in exisiting vegetation from extensive rhizome system in a wide variety of conditions (Fellows, 2006). Sources of information: Garske & Schimpf, 2005; Fellows, 2006; author's (Moore's) personal observations.		
		her species in the genus invasive in New York or elsewhere		
	A.	No V		0
	B.	Yes Unknown		3
	U.	Ulkliowii	Score	0
		Documentation: Species:		o l
		Total Po	ossible	25
		Section Two	o Total	16

#### 3. ECOLOGICAL AMPLITUDE AND DISTRIBUTION

3.1. Density of stands in natural areas in the northeastern USA and eastern Canada (use

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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: Large dense stands always reported in areas with numerous other invasive species present. Sources of information:	
	Mehrhoff et al., 2004; Garske & Schimpf, 2005; Fellows, 2006; author's (Moore's) personal observations.	
3.2. Nu	imber 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	
0.	Score	2
	Documentation:	_
	Identify type of habitats where it occurs and degree/type of impacts:	
	See A2.3.	
	Sources of information:	
3 3 Ro	Fellows, 2006; Brooklyn Botanic Garden, 2008.  le of disturbance in establishment	
A.	Requires anthropogenic disturbances to establish.	0
В.	May occasionally establish in undisturbed areas but can readily establish in areas with natural	2
В.	or anthropogenic disturbances.	_
C.	Can establish independent of any known natural or anthropogenic disturbances.	4
U.	Unknown	
	Score	0
	Documentation:	
	Identify type of disturbance: Reported and observed to occur only in areas with anthropogenic disturbance.	
	Sources of information:	
	Mehrhoff et al., 2004; Fellows, 2006; author's personal observations.	
3.4. Cli	imate in native range	
Α.	Native range does not include climates similar to New York	0

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B. C. U.	Native range possibly includes climates similar to at least part of New York.  Native range includes climates similar to those in New York  Unknown		1 3
U.		ore	3
	Documentation: Describe what part of the native range is similar in climate to New York: Europe and temperate Asia. Sources of information: Fellows, 2006; Brooklyn Botanic Garden, 2008.		
3.5. Cu	rrent introduced distribution in the northeastern USA and eastern Canada (see		
-	n 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.  Present as a non-native in 2 or 3 northeastern USA states and/or eastern Canadian provinces.		1
C. 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 eastern Canadian province.		2 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 eastern Canadian provinces.	s or	4
U.	Unknown	F	4
	Documentation:	ore	4
	Identify states and provinces invaded: CT, DC, DE, IL, IN, KY, MA, MD, ME, MI, MN, NH, NJ, NY, PA, RI, VA, VT, WI, WV; NF, NS, ON, PE, QC. 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.	NB,	
	rrent introduced distribution of the species in natural areas in the eight New Yo	ork	
	RISMs (Partnerships for Regional Invasive Species Management)  Present in none of the PRISMs		0
A. B.	Present in 1 PRISM		0
C.	Present in 2 PRISMs		2
D.	Present in 3 PRISMs		3
E. U.	Present in more than 3 PRISMs or on the Federal noxious weed lists Unknown	_	4
	Sco	ore	4
	Documentation: Describe distribution: All PRISMs; see A1.1. Sources of information: Weldy & Werier, 2005; Brooklyn Botanic Garden, 2008.		
	Total Possil	hle 「	25
	Section Three To	<u> </u>	25 15

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4. DIFFICULTY OF CONTROL 4.1. Seed banks Seeds (or vegetative propagules) remain viable in soil for less than 1 year, or does not make A. 0 viable seeds or persistent propagules. Seeds (or vegetative propagules) remain viable in soil for at least 1 to 10 years 2 В Seeds (or vegetative propagules) remain viable in soil for more than 10 years C. 3 Unknown IJ Score 0 Documentation: Identify longevity of seed bank: Seed production sparse and seeds only germinate the following season; no evidence that rhizomes can function as persistent propaggules Sources of information: Garske & Schimpf, 2005; Fellows, 2006. 4.2. Vegetative regeneration No regrowth following removal of aboveground growth 0 A. Regrowth from ground-level meristems B. Regrowth from extensive underground system 2 C. Any plant part is a viable propagule 3 D. Unknown U. Score 2 Documentation: Describe vegetative response: Regrowth from extensive underground rhizome system. Sources of information: Garske & Schimpf, 2005; Fellows, 2006; author's personal observations. 4.3. Level of effort required Management is not required: e.g., species does not persist without repeated anthropogenic 0 Α disturbance. Management is relatively easy and inexpensive: e.g. 10 or fewer person-hours of manual effort 2 (pulling, cutting and/or digging) can eradicate a 1 acre infestation in 1 year (infestation averages 50% cover or 1 plant/100 ft<sup>2</sup>). Management requires a major short-term investment: e.g. 100 or fewer person-hours/year of 3 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). Management requires a major investment: e.g. more than 100 person-hours/year of manual 4 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). U. Unknown Score 4 Documentation: Identify types of control methods and time-term required: Only specific herbicides delivered at certain times have an impact. Hand pulling must involve removal of rhizomes to prevent re-sprouting. Seed bank not long lived. Sources of information: Garske & Schimpf, 2005; Fellows, 2006. **Total Possible** 10 Section Four Total

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Total for 4 sections Possible 80
Total for 4 sections 51

#### 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: 'variegata'

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