INDIANA
NON-NATIVE PLANT INVASIVENESS RANKING FORM

ASSESSMENT FOR INVASIVE PLANTS NOT IN TRADE
Form originally created for use in New York
Indiana Form version date: November 1, 2010

Scientific name:	*Torilis arvensis* and *T. japonica* USDA Plants Code: TOAR, TOJA
Common names:	Spreading Hedge Parsley and Japanese Hedge Parsley
Native distribution:	Africa, Europe, Middle East, and Central Asia
Date assessed:	6/23/2013; Updated 8/16/2018 (Ellen Jacquart)
Assessors:	Zach Deitch, Ellen Jacquart
Reviewers:	Reviewed by Stuart Orr 8/17/2018
Date Approved:	10/30/2019 by IPAC (David Gorden, Will Drews, Ross Miller, Ellen Jacquart, Dawn Slack)

Note – *T. arvensis* and *T. japonica* are considered very similar species, distinguished only by the number of bracts subtending the umbels of flowers. All other characteristics – size, number of flowers/seeds, leaf shape and size, and autecology – appear to be indistinguishable. Indeed, per Hilty (2013) the two species have been regularly misidentified as each other in Illinois reports, and we believe the same is true in Indiana. For this reason, the two species are assessed together; it is noted wherever questions are answered separately for the two species.

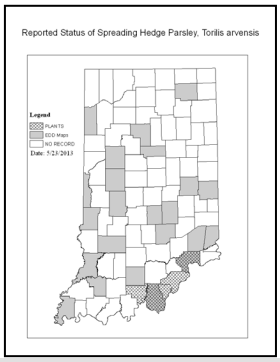
Indiana Invasiveness Rank:

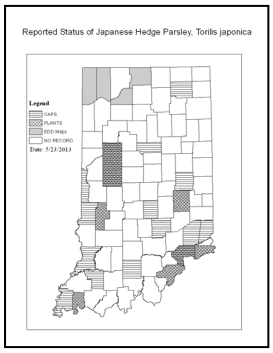
Invasiveness Ranking Summary (see details under appropriate sub-section)		Total (Total Answered*) Possible	Total
1	Ecological impact	40 (30)	17
2	Biological characteristic and dispersal ability	25 (25)	25
3	Ecological amplitude and distribution	25 (25)	24
4	Difficulty of control	10 (10)	6
	Outcome score	100 (90)[b]	72 [a]
	Relative maximum score †		80
	Indiana Invasiveness Rank §	High	

* 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):

A1 Has this species been documented to persist without cultivation in IN? (reliable source; voucher not required)	
☒	**Yes – continue to A2.2**
☐	No – continue to A2.1
A2What is the likelihood that this species will occur and persist outside of cultivation given the climate in Indiana? (obtain from occurrence data in other states with similar climates)	
☒	Likely – continue to A3





Documentation:

Sources of information: Range maps compiled from PLANTS database, http://plants.usda.gov/java/; Indiana CAPS database, http://extension.entm.purdue.edu/CAPS/index.html; Indiana IPSAWG reports (unpublished); and EDDMapS reports, http://eddmaps.org/ Update 8/10/2018 – new counties added in EDDMaps for T. arvensis: Owen, Monroe, Morgan, Switzerland, and Lawrence. New counties added in EDDMapS for T. japonica: Jasper, Marshall, Lagrange, Steuben, and Shelby.

A3 Describe the potential or known suitable habitats within Indiana (underlined). Natural habitats include all habitats not under active human management. Managed habitats are indicated with an asterisk.

Aquatic Habitats	Wetland Habitats	Upland Habitats
Rivers/streams	Marshes	Forest
Natural lakes and ponds	Fens	Savannas
Reservoirs/impoundments*	Bogs	Barrens
	Shrub swamps	Prairies
	Forested wetlands/riparian	Cultivated*
	Beaches/dunes	Old Fields*
	Ditches*	Roadsides*

Other potential or known suitable habitats within Indiana:

Documentation: *Hedge parsleys invade forests, grassland, hedgerows, and roadsides (Wisconsin DNR 2012). Habitats include thickets, woodland borders, weedy meadows, areas along railroads and roadsides, gravelly areas along streams, and waste areas. Disturbed habitats are preferred, including degraded prairies and woodlands that have been recently logged (Hilty 2013) Many savannas in northwest Indiana have been invaded (Jacquart, personal observation)*
rces of informati

B. INVASIVENESS RANKING
Questions apply to areas similar in climate and habitats to Indiana 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 U

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

There were no studies found on ecosystem impacts of either Torilis species; such impacts have not been studied.

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:
T. japonica - Spreads incredibly fast and persistent. Appears to be very competitive to species up to 4-5' tall. Shades out all other plants where growing. Can eliminate ground flora and eventually may prevent tree regeneration. (Sheehan 2007)

Hedge parsleys invade forests, grasslands, hedgerows, roadsides, and urban areas. T. japonica "behaves as a winter annual in Kentucky and sometimes forms large populations in disturbed shallow-soil areas that are not mowed during the summer." (Baskin and Baskin 1975). This same characteristic has been noted in Indiana and results in a dense layer of Torilis in savannas. (Jacquart, personal observation).

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 3

Documentation:
Identify type of impact or alteration:
T. japonica "behaves as a winter annual in Kentucky and sometimes forms large populations in disturbed shallow-soil areas that are not mowed during the summer." (Baskin and Baskin 1975).
This same characteristic has been noted in Indiana and results in displacement of native plants in the infestation. (Jacquart, personal observation).
Hedge parsley is also a vicious competitor and voraciously outcompetes native wildflowers (Moran 2007)
Appears to be very competitive to species up to 4-5' tall. Shades out all other plants where growing. Completely eliminates smaller plants and dependent wildlife in dense infestations (Sheehan 2007)

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: 7

Documentation:
Identify type of impact or alteration:
Pets, such as dogs, and other animals appear to be spreading hedge parsley quickly throughout the state because it has seeds that stick tightly to fur and clothing
(Moran 2007, Wisconsin Department of Natural Resources 2012).

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: 4

Documentation:
Describe key reproductive characteristics (including seeds per plant):
Each compound umbel has about 8 umbellets; each umbellet has about 8 flowers, each of which produces a single seed (Hilty 2013). Thus, a plant with more than one compound umbel produces more than 100 seeds; typically, a medium-sized plant has at least 10 compound umbellets (Jacquart personal observation).

T. japonica has high germination rates when collected in the fall and exposed to light – typically over 80% germination (Baskin and Baskin 1975).

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	2

dispersal, but studies report that 95% of seeds land within 100 meters of the parent plant)

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: *The seed of both species is dispersed on ripening, by animals and farm machinery. The hooked bristles on the seeds enable them to stick to clothing and animal fur. (Sheehan 2007, Moran 2007, Panke and Renz 2012, Hilty 2013, Wisconsin DNR 2012).*

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:
*Seeds can adhere to farm machinery, vehicles, agricultural produce, fur and clothing because it has velcro-like seeds (*Sheehan 2007).
.

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:
It tolerates a wide range of light conditions (Panke and Renz 2012), fruits that are spread by animals (Sheehan 2007), grows on 'waste area' and highly infertile sites like railroad ROWS (Hilty 2013).

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:
T. japonica - Shades out all other plants where growing. (Sheehan 2007)
Dense layer 3-4' tall forms over shorter vegetation in savannas (Jacquart, personal observation).

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:
The plant prefers light (sandy), medium (loamy) and heavy (clay) soils and requires well-drained soil. The plant prefers acid, neutral and basic (alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It requires dry or moist soil. It can grow in undisturbed and disturbed habitats.(Tenaglia 2004).

2.7. Other species in the genus invasive in Indiana or elsewhere

A. No 0
B. Yes 3
U. Unknown

Score 3

Documentation:
Torilis japonica and T. arvensis are both reported as invasive in Indiana.

Total Possible 25
Section Two Total 25

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 2

disturbed landscapes

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:
This species is forming large dense stands in savannas in northwest Indiana; the only disturbance in these habitats is prescribed fire, which is a natural disturbance. (Jacquart, personal observation).

3.2. Number of habitats the species may invade

A. Not known to invade any natural habitats given at A2.2 0

B. Known to occur in two or more of the habitats given at A2.2, with at least one a natural habitat. 1

C. Known to occur in three or more of the habitats given at A2.2, with at least two a natural habitat. 2

D. Known to occur in four or more of the habitats given at A2.2, with at least three a natural habitat. 4

E. Known to occur in more than four of the habitats given at A2.2, 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:
Seven habitats identified in A3 with four of them being a natural habitat.

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:

Is capable of invading disturbed and undisturbed areas (Sheehan 2007).

3.4. Climate in native range

A. Native range does not include climates similar to Indiana 0

B. Native range possibly includes climates similar to at least part of Indiana 1

C. Native range includes climates similar to those in Indiana 3

U. Unknown

Score 3

Documentation:

Describe what part of the native range is similar in climate to Indiana:
It is native to Asia, which has a climate similar to Indiana's.

Sources of information:
USDA, NRCS. 2007.

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:
Pacific Northwest of North America, South central US, Northeast and North Central US. Also found in British Columbia.

Sources of information:
USDA, NRCS. 2007.
Wisconsin State Herbarium. 2007.

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

A.	Present in no Indiana counties	0
B.	Present in 1-10 Indiana counties	1
C.	Present in 11-20 Indiana counties	2
D.	Present in 21-50 Indiana counties	3
E.	Present in more than 50 Indiana counties or on Federal noxious weed list	4
U.	Unknown	

Score: 3

Documentation:
Describe distribution:
T. arvensis documented in 31 counties and T. japonica in 30 counties in IN as of 8/10/2018.
Sources of information:
See A1

Total Possible: 25
Section Three Total: 24

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: 2

Documentation:
Seed of T. japonica ripens in July and is ready to germinate; however, cold temperatures induce dormancy in the seed and appear to keep it from germinating for at least a year. (Baskin and Baskin 1975)

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: 1

Documentation:
Describe vegetative response:
Grows from a taproot (Panke and Renz 2012).

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: 3

Documentation:
Most chemical methods are at best 70-90% in the season after treatment, requiring multiple years of follow up. Also, the induced dormancy of seeds means that they will potentially continue to germinate over a long period of time, meaning that retreatment will be needed (Baskin and Baskin 1975).

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

Total for 4 sections 72

References for species assessment:

Baskin, J.M. and C.C. Baskin. 1975. Ecophysiology of seed dormancy and germination in *Torilis japonica* in relation to its life cycle strategy. Bulletine of the Torrey Botanical Club. 102(2). P. 67-72.

Gibson, R. H., Nelson, I. L., Hopkins, G. W., Hamlett, B. J., Memmott, J. 2006. "Pollinator webs, plant communities and the conservation of rare plants: arable weeds as a case study". Journal of Applied Ecology. 43 (2). P. 246-257.

Hilty, J. 2013. "Illinois Wildflowers. Common Hedge Parsley". http://www.illinoiswildflowers.info/weeds/plants/hdg_parsley.htm. (Web Site Accessed on: August 16, 2018).

Moran, V. 2007. "Torilis-The Guest From Hell". http://knowyournature.wordpress.com/2007/08/08/torilis-the-guest-from-hell/ (Web Site Accessed on: August 16, 2018).

Panke, B. and M. Renz. 2012. Hedge-parsleys (Torilis spp.). University of Wisconsin – Cooperative Extension. 2 pp. http://learningstore.uwex.edu/Assets/pdfs/A3924-08.pdf (Web Site Accessed on Aug. 20, 2018)

Sheehan, M. 2007. Wisconsin Invasive Plant Assessment for Torilis japonica. http://dnr.wi.gov/topic/Invasives/documents/classification/LR_Torilis_japonicus.pdf. (Web Site Accessed on: August 16, 2018).

Tenaglia, D.. Missouri Flora Webpage 2004. *Torilis japonica.* http://www.missouriplants.com/Whitealt/Torilis_japonica_page.html. (Web Site Accessed on: Aug 16, 2018).

USDA, NRCS. 2007. The PLANTS Database (http://plants.usda.gov, 12 June 2013). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Wisconsin Department of Natural Resources. 2012. " Invasive Species". https://dnr.wi.gov/topic/invasives/fact/japanesehedgeparsley.html. (Web Site Accessed on: August 16, 2018).

Citation: This IN ranking form may be cited as: Jacquart, E.M. 2011. Invasiveness ranking system for non-native plants of Indiana. Unpublished. Invasive Plant Advisory Committee (IPAC) to the Indiana Invasive Species Council, Indianapolis, IN.

Acknowledgments: The IN ranking form is an adaptation for Indiana use of the form created for New York by Jordan et al. (2009), cited below. Documentation for species assessed for New York are used for Indiana where they are applicable. The Invasive Plant Advisory Committee was created by the Indiana Invasive Species Council in October 2010, and is made up of the original members of the Indiana Invasive Plant Assessment Working Group (IPSAWG). Original members of IPSAWG included representatives of the The Nature Conservancy; Indiana

Native Plant and Wildflower Society; Indiana Nursery and Landscape Association; Indiana Chapter of the American Society of Landscape Architects; Indiana Forage Council; Indiana Wildlife Federation; Indiana State Beekeepers Association; Indiana Beekeeper's Association; Department of Natural Resources; Hoosier National Forest; Indiana Academy of Science; Natural Resources Conservation Service; Indiana Department of Environmental Management; Indiana Department of Transportation; Purdue Cooperative Extension Service; Seed Administrator, Office of the Indiana State Chemist.

References for the Indiana ranking form:

Jordan, M.J., G. Moore, and T.W. Weldy. 2009. 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.

References for the New York ranking form:

Carlson, Matthew L., Irina V. Lapina, Michael Shephard, Jeffery S. Conn, Roseann Densmore, Page Spencer, Jeff Heys, Julie Riley, Jamie Nielsen. 2008. Invasiveness ranking system for non-native plants of Alaska. Technical Paper R10-TPXX, USDA Forest Service, Alaska Region, Anchorage, AK XX9. Alaska Weed Ranking Project may be viewed at: http://akweeds.uaa.alaska.edu/akweeds_ranking_page.htm.

Heffernan, K.E., P.P. Coulling, J.F. Townsend, and C.J. Hutto. 2001. Ranking Invasive Exotic Plant Species in Virginia. Natural Heritage Technical Report 01-13. Virginia Dept. of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. 27 pp. plus appendices (total 149 p.).

Morse, L.E., J.M. Randall, N. Benton, R. Hiebert, and S. Lu. 2004. An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity. Version 1. NatureServe, Arlington, Virginia. http://www.natureserve.org/getData/plantData.jsp

Randall, J.M., L.E. Morse, N. Benton, R. Hiebert, S. Lu, and T. Killeffer. 2008. The Invasive Species Assessment Protocol: A Tool for Creating Regional and National Lists of Invasive Nonnative Plants that Negatively Impact Biodiversity. Invasive Plant Science and Management 1:36–49

Warner, Peter J., Carla C. Bossard, Matthew L. Brooks, Joseph M. DiTomaso, John A. Hall, Ann M.Howald, Douglas W. Johnson, John M. Randall, Cynthia L. Roye, Maria M. Ryan, and Alison E. Stanton. 2003. Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands. Available online at www.caleppc.org and www.swvma.org. California Exotic Pest Plant Council and Southwest Vegetation Management Association. 24 pp.

Williams, P. A., and M. Newfield. 2002. A weed risk assessment system for new conservation weeds in New Zealand. Science for Conservation 209. New Zealand Department of Conservation. 1-23 pp.