INDIANA

NON-NATIVE PLANT INVASIVENESS RANKING FORM

ASSESSMENT FOR INVASIVE PLANTS NOT IN TRADE

Form version date: March 3, 2009

Scientific name:	Hypericum perforatum L.	USDA Plants Code: HYPE
Common names:	Common St. John's-wort	
Native distribution:	Eurasia, North Africa	
Date assessed:	July 12, 2012	
Assessors:	Ellen Jacquart	
Reviewers:	Stuart Orr	
Date Approved:	September 21, 2012	

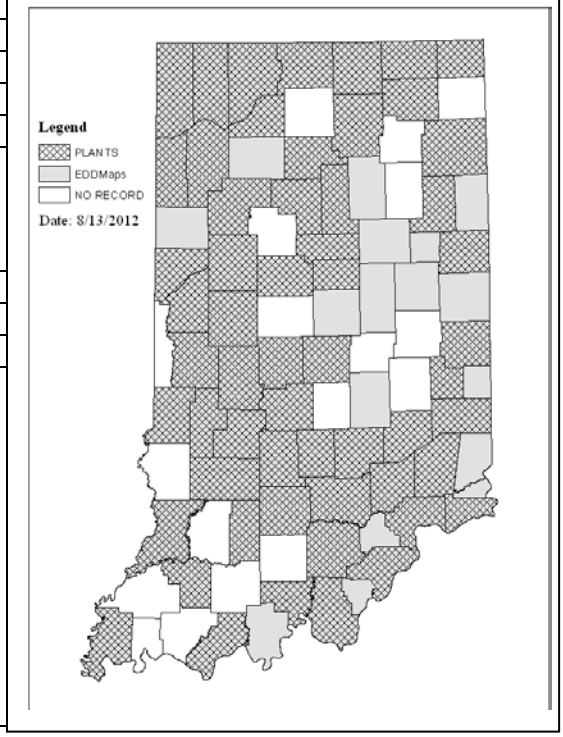
Indiana Invasiveness Rank: Low (Relative Maximum Score 40.00-49.99)

Invasiveness Ranking Summary (see details under appropriate sub-section)		Total (Total Answered*) Possible	Total
1	Ecological impact	40 (20)	0
2	Biological characteristic and dispersal ability	25 (22)	14
3	Ecological amplitude and distribution	25 (25)	17
4	Difficulty of control	10 (10)	3
	Outcome score	100 (77)[b]	34[a]
	Relative maximum score †		44.16
	Indiana Invasiveness Rank §	Low (Relative Maximum Score 40.00-49.99)	

* 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

A. DISTRIBUTION (KNOWN/POTENTIAL):

A1.1. 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
A2.1. What 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 A2.2
☐	Not likely



Documentation:
Sources of information:
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Indiana CAPS database, http://extension.entm.purdue.edu/CAPS/index.html; Indiana IPSAWG reports (unpublished); and EDDMapS reports, http://eddmaps.org/.

If the species does not occur and is not likely to occur in Indiana, then stop here as there is no need to assess the species.

A2.2. 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:
Railroads, forest margins, waste grounds, riverbanks.

Documentation:
Sources of information:
authors' personal observations; Crompton et al, 1988; Fellows, 2004; Brooklyn Botanic Garden, 2009.

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)
While considered a serious problem in western North America (Crompton et al, 1988; Fellows, 2004), it is only minor (albiet ubiquitous) weed in eastern North America (Crompton et al, 1988). No literature has been located suggesting impacts to natural ecosystem processes in eastern North America.
Sources of information:
Crompton et al, 1988; Fellows, 2004.

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 0

Documentation:
Identify type of impact or alteration:
While conisdered a serious problem in western North America (Crompton et al, 1988; Fellows, 2004), it is only minor (albiet ubiquitous) weed in eastern North America (Crompton et al, 1988). It has not been observed to impact natural community structure in the Northeast region (authors' personal observations), nor has any literature been located suggesting impacts to natural community structure in eastern North America.
Sources of information:
Authors' personal observations; Crompton et al, 1988; Fellows, 2004.

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 0

Documentation:
Identify type of impact or alteration:
While considered a serious problem in western North America (Crompton et al, 1988; Fellows, 2004), it is only minor (albiet ubiquitous) weed in eastern North America (Crompton et al, 1988). It has not been observed to impact natural community composition in the Northeast region (authors' personal observations), nor has any literature been located suggesting impacts to natural community composition in eastern North America.
Sources of information:
author's personal observations; Crompton et al, 1988; Fellows, 2004.

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:
While conisdered a serious problem in western North America (Crompton et al, 1988; Fellows, 2004), it is only minor (albiet ubiquitous) weed in eastern North America (Crompton et al, 1988). No literature been located researching impacts to other species groups in eastern North America.
Sources of information:
Author's personal observations; Crompton et al, 1988; Fellows, 2004.

Total Possible: 20
Section One Total: 0

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):
Copious seed production- reportedly as high as 33, 000 seeds per plant.
Sources of information:
Crompton et al, 1988; 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 2

Documentation:
Identify dispersal mechanisms:
Endozoochory (animal) and hydrochory (water) can occur; seeds quite small. Czamecka reported "effective dispersal."
Sources of information:
Crompton et al, 1988; Czarnecka, 2005.

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:
Historically and currently used medicinally for substance abuse and dependence, for the treatment of neurological disorders and depression, and antiviral and antibacterial effects. Also occassionally used as an ornamental. Limited sales of the plant for use in the herbal trade. Small seeds easily moved through indrect means.
Sources of information:
Crompton et al, 1988;Barnes et al., 2001; Fellows, 2004; Nishimura et al., 2007; Uzbay, T. I. 2008.

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, rapid and deep root system growth and rapid vegetative growth early in the Spring provides a competative advantage over other plant species (Crompton et al, 1988).
Reported to be extremely drought resistant (Fox et al., 1999).
Adaptive reproductive system- is a facultative apomict as well producing seeds via out-crossing pollination (Crompton et al, 1988; Pank et al., 2003; Barcaccia et al., 2006).
An investigation of North American populations found "substantial genetic variation" (Maron et al., 2004), perhaps enhancing ecological amplitude.

Sources of information:
Crompton et al, 1988; Fox et al., 1999; Pank et al., 2003; Maron et al., 2004; Barcaccia et al., 2006.

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 0

Documentation:
Describe growth form:
Neither observed forming thickets or possessing a smothering habit in the CT-NJ-NY area, nor any literature found suggesting this.
Sources of information:
author's personal observations.

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:
Germination rates as high as 98% have been reported (Perez-Garcia et al., 2006); but the role of disturbance or vegetative competition was not addressed.
Sources of information:
Perez-Garcia et al., 2006.

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

A. No 0
B. Yes 3
U. Unknown

Score 0

Documentation:
Species:
None- U.S.D.A., 2009; Weldy & Werier, 2009.

Total Possible 22
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 0

Documentation:
Identify reason for selection, or evidence of weedy history:
A ubiquitous weed, but neither seen forming large stands in the region by authors nor any literature located to suggest this.
Sources of information:
Authors' personal observations; Fellows, 2004.

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 4

Documentation:
Identify type of habitats where it occurs and degree/type of impacts:
See A2.2.
Sources of information:
Authors' personal observations; Crompton et al, 1988; Fellows, 2004; 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 2

Documentation:
Identify type of disturbance:
Readily establishes in disturbed areas, not known to require anthropogenic disturbance.
Sources of information:
Author's personal observations; Fellows, 2004.

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 New York:
Northern Europe.
Sources of information:
Tutin & Heywood, 1968.

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:
Documented from all northeastern states and provinces.
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 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 4

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

Total Possible 25
Section Three Total 17

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	0

viable seeds or persistent propagules.

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:
Identify longevity of seed bank:
Seeds reported to be viable in the soil for up to 10 but not more than 10 years.
Sources of information:
Fellows, 2004.

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:
Perennial with rhizomes but not extensive underground root system.
Sources of information:
Crompton et al, 1988

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 0

Documentation:
Identify types of control methods and time-term required:
Species does not occur in large stands and management is not known to be required at this time.

Chemical: 2,4-D esters, glyphosate, terbacil, dichlobenil, karbutilate, and metobromuron have been reported as effective in controlling H. perforatum (Crompton et al, 1988).
A single application of fluoroxypyr, triclopyr, and picloram were reported effective in Australia (Campbell & Nicol, 2000).

Fire: Ineffective, shown to promote vegetative regrowth and seed germination (Crompton et al, 1988). Although one Oregon study (Clark & Wilson, 2001) found burning combined

with hand-removal "particularly reduced" the cover of Hypericum perforatum.

Biocontrol: Several insect enemies of H. perforatum have been used in western North America with varing degrees of success. Insect and fungal pathogens have been documented attacking H. perforatum in eastern North America (Crompton et al, 1988); with Colletotrichum gloeosporioides showing promise as a potential mycoherbicide (Hildebrand & Jensen, 1991).

Sources of information:
Crompton et al, 1988;Hildebrand & Jensen, 1991; Campbell & Nicol, 2000; Clark & Wilson, 2001.

Total Possible	10
Section Four Total	3
Total for 4 sections Possible	77
Total for 4 sections	34

References for species assessment:

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Campbell, M. H. & H. I., Nicol. 2000. Effect of split applications of herbicides on the control of Hypericum perforatum L. (St. John's wort) and regeneration of native grasses and annual clovers on non-arable land. Plant Protection Quarterly. 15(3):119-122.

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Fox, L. R., S. P. Ribeiro, V. K. Brown, J. G. Masters & I. P. Clarke. 1999. Direct and indirect effects of climate change on St John's wort, Hypericum perforatum L. (Hypericaceae). Oecologia (Berlin). 120(1):113-122.

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Weldy, T. & D. Werier. 2009. New York Flora Atlas. [S. M. Landry and K. N. Campbell (original application development), Florida Center for Community Design and Research. University of South Florida]. New York Flora Association, Albany, New York. [Accessed on May 8 2009].

Citation: This IN ranking form may be cited as: Jacquart, E.M. 2012. 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 form incorporates components and approaches used in several other systems, cited in the references below. 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 ranking form:

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