

NAME OF SPECIES: Paulownia tomentosa (Thunb.) Sieb. & Zucc. ex Steud. (1)	
Synonyms: Bignonia tomentosa Thunb. (basionym); Paulownia imperialis Siebold & Zucc. (2)	
Common Name: princess tree (1). empres tree; foxglove tree; karri tree (2). royal paulownia (3).	
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
	2. <u>Abundance:</u>
	3. <u>Geographic Range:</u>
	4. <u>Habitat Invaded:</u> Disturbed Areas <input type="checkbox"/> Undisturbed Areas <input type="checkbox"/>
	5. <u>Historical Status and Rate of Spread in Wisconsin:</u>
	6. <u>Proportion of potential range occupied:</u>
II. Invasive in Similar Climate Zones	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> <u>Where (include trends):</u> Much of the eastern U.S. from Massachusetts to Texas, including Ohio, Indiana and Illinois (7) (8). It was first introduced into the United States in the mid 1800s, and has since escaped cultivation and naturalized in many areas of the eastern U.S (3).
III. Invasive in Similar Habitat Types	1. Upland <input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Dune <input type="checkbox"/> Prairie <input type="checkbox"/> Aquatic <input type="checkbox"/> Forest <input checked="" type="checkbox"/> Grassland <input type="checkbox"/> Bog <input type="checkbox"/> Fen <input type="checkbox"/> Swamp <input type="checkbox"/> Marsh <input type="checkbox"/> Lake <input type="checkbox"/> Stream <input checked="" type="checkbox"/> Other: Paulownia can invade a variety of different habitats including roadsides, cliffs, riparian areas, open woods, highway embankments, stream banks, forest edges, landslides, burned-over areas, rocky out-croppings, mine spoils, old home sites, and other disturbed sites (5)
IV. Habitat Effected	1. <u>Soil types favored or tolerated:</u> Princess tree grows well in average, medium wet, well-drained soils in full sun. Prefers sandy humusy loams with good drainage. Tolerates a wide range of soils including poor, dry ones, but dislikes unamended heavy clay soils. (3) pH range is 4.5-7.5 (2). Royal paulownia can tolerate infertile, shallow, rocky, alkaline to acidic, or very dry soils. It can even invade nearly vertical rock walls and cracks in concrete.(5)
	2. <u>Conservation significance of threatened habitats:</u> Its ability to colonize rocky or infertile sites, make paulownia a threat to some rare plants that require these marginal habitats. Its ability to resprout or colonize by seed quickly after a fire creates problems when managing species such as table mountain pine that require fire for regeneration.(5)
V. Native Habitat	1. <u>List countries and native habitat types:</u> From central and western China and Japan (2) (3).
VI. Legal Classification	1. <u>Listed by government entities?</u> Connecticut: Potentially invasive, banned (1)
	2. <u>Illegal to sell?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Connecticut (1)
B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS	
I. Life History	1. <u>Type of plant:</u> Annual <input type="checkbox"/> Biennial <input type="checkbox"/> Monocarpic Perennial <input type="checkbox"/> Herbaceous Perennial <input type="checkbox"/> Vine <input type="checkbox"/> Shrub <input type="checkbox"/> Tree <input checked="" type="checkbox"/>

	<p>2. <u>Time to Maturity</u>: Royal paulownia trees start bearing seed after 8 to 10 years (4).</p> <p>3. <u>Length of Seed Viability</u>: NA</p> <p>4. <u>Methods of Reproduction</u>: Asexual <input checked="" type="checkbox"/> Sexual <input checked="" type="checkbox"/> <u>Notes</u>: Each capsule contains up to 2,000 seeds, and a large tree may produce as many as 20 million seeds a year. Also royal paulownia roots sprout easily. (4).</p> <p>5. <u>Hybridization potential</u>: NA</p>
II. Climate	<p>1. <u>Climate restrictions</u>: Requires a minimum of 180 frost free days (2). Zones 5-8 (3).</p> <p>2. <u>Effects of potential climate change</u>: Global warming may move the northern limits of princesstree's range further north.</p>
III. Dispersal Potential	<p>1. <u>Pathways - Please check all that apply</u>:</p> <p><u>Unintentional</u>: Bird <input type="checkbox"/> Animal <input type="checkbox"/> Vehicles/Human <input type="checkbox"/> Wind <input checked="" type="checkbox"/> Water <input checked="" type="checkbox"/> Other: Tiny winged seed (4).</p> <p><u>Intentional</u>: Ornamental <input checked="" type="checkbox"/> Forage/Erosion control <input type="checkbox"/> Medicine/Food: <input type="checkbox"/> Other: Princesstree has also been used effectively in poor soils in surface strip-mine reclamation areas (3). The species has value for its small saw logs that are in demand for specialty products (4).</p> <p>2. <u>Distinguishing characteristics that aid in its survival and/or inhibit its control</u>: Princesstree is very responsive to disturbance including an increase in light, soil disturbance, and fire. It re-sprouts vigorously after being cut, invades readily after disturbance or fire (particularly spring fires), and grows rapidly (roots sprouts can grow over 15 feet a year). (5)</p>
IV. Ability to go Undetected	1. HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> LOW <input checked="" type="checkbox"/>
C. DAMAGE POTENTIAL	
I. Competitive Ability	<p>1. <u>Presence of Natural Enemies</u>: No major insect pests are known for royal paulownia in the United States. No major disease problems have appeared yet in the United States. (4)</p> <p>2. <u>Competition with native species</u>: No evidence of disproportionate impacts on particular species. (7)</p> <p>3. <u>Rate of Spread</u>: -change in relative dominance over time: -change in acreage over time: HIGH(1-3 yrs) <input type="checkbox"/> MEDIUM (4-6 yrs) <input type="checkbox"/> LOW (7-10 yrs) <input checked="" type="checkbox"/> <u>Notes</u>: At least some expansion or increase in abundance is inferred given increasing levels of disturbance in general across most landscapes and the active promotion of this species as a fast-growing timber crop by many U.S. silvicultural sites. Such tree plantations could serve as focal points for dispersal. It also seems at least possible that this species could escape in parts of the western U.S. warmer than USDA Zone 4 or 5. Most sources report that this</p>

	tree is quite tolerant of dry (as well as moist), exposed conditions. (7).
II. Environmental Effects	1. <u>Alteration of ecosystem/community composition?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: May establish in previously burned areas and forests defoliated by pests (including gypsy moth) or landslides (5) (7).
	2. <u>Alteration of ecosystem/community structure?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Can establish in disturbed areas and very quickly grow to the size of a large tree. Its rapid growth rate, up to 15 feet in one year, and ability for form a quick canopy has led to its designation as a "miracle tree" or "super tree" (Paulownia.org, not dated). However, it does not typically form a dense thickets or canopies. (7)
	3. <u>Alteration of ecosystem/community functions and processes?</u> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Notes:
	4. <u>Allelopathic properties?</u> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Notes:
D. SOCIO-ECONOMIC Effects	
I. Positive aspects of the species to the economy/society:	Notes: Used as an astringent and for warts (2). Royal paulownia was introduced into this country as an ornamental, and it still retains some popularity for that purpose. Its use in reclamation of the disturbed soils of surface mines grows yearly. The wood is highly prized for the manufacture of specialty items in Asia, and there is a brisk export business of logs to Japan. The export market has led to establishment of commercial plantations in this country. (4)
II. Potential socio-economic effects of requiring controls: Positive: Negative:	Notes:
III. Direct and indirect socio-economic effects of plant:	Notes:
IV. Increased cost to sectors caused by the plant:	Notes: NA
V. Effects on human health:	Notes: NA
VI. Potential socio-economic effects of restricting use: Positive: Negative:	Notes:
E. CONTROL AND PREVENTION	
I. Costs of Prevention (including education; please be as specific as possible):	Notes: NA
II. Responsiveness to prevention efforts:	Notes: NA

III. Effective Control tactics:	Mechanical <input checked="" type="checkbox"/> Biological <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Times and uses: Control Recommendations: For large trees make stem injections using Arsenal AC or a glyphosate herbicide, anytime except March and April. For felled trees, apply these herbicides to stem and stump tops immediately after cutting. Treat saplings with a basal spray of Garlon. Treat resprouts and seedlings with a foliar spray in July - October. (5) Large trees can also be girdled though there will be resprouting. Hand pulling may be effective for young seedlings. Plants should be pulled as soon as they are large enough to grasp. The entire root must be removed since broken fragments may re-sprout. Cutting is most effective when trees have begun to flower to prevent seed production. (6)
IV. Minimum Effort:	Notes: Existing trees can be eliminated but new seedlings must be removed until growth of other vegetation prevents new establishment (7).
V. Costs of Control:	Notes: NA
VI. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: NA
VII. Non-Target Effects of Control:	Notes: Native species can be negatively affected by herbicides.
VIII. Efficacy of monitoring:	Notes: NA
IX. Legal and landowner issues:	Notes: Planted on private lands for ornamental or commercial purposes and will reinvade from these sources (7).

F. REFERENCES USED:

- UW Herbarium
- WI DNR
- TNC
- Native Plant Conservation Alliance
- IPANE
- USDA Plants

Number	Reference
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3	Kemper Center for Home Gardening, Missouri Botanical Garden, http://www.mobot.org/gardeninghelp/plantfinder/Plant.asp?code=A888
4	Bonner, F.T. Royal Paulownia. In: Burns, Russell M., and Barbara H. Honkala, tech. coords. 1990. Silvics of North America: 1. Conifers; 2. Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. vol.2, 877 p.
5	Evans C. W., D. J. Moorhead, C. T. Barger and G. K. Douce. 2006. Invasive Plant Responses to Silvicultural Practices in the South. The University of Georgia, Bugwood Network. BW-2006-03 http://www.invasive.org/silvicsforinvasives.pdf
6	Global Invasive Species Database, 2007. Paulownia tometosa.

	http://www.issg.org/database/species/ecology.asp?si=440&fr=1&sts=sss [Accessed 2 May 2007].
7	NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer . (Accessed: May 2, 2007).
8	Czarapata, Elizabeth J. 2005. Invasive Plants of the Upper Midwest: An Illustrated Guide to their Identification and Control. The University of Wisconsin Press, Madison, WI.

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