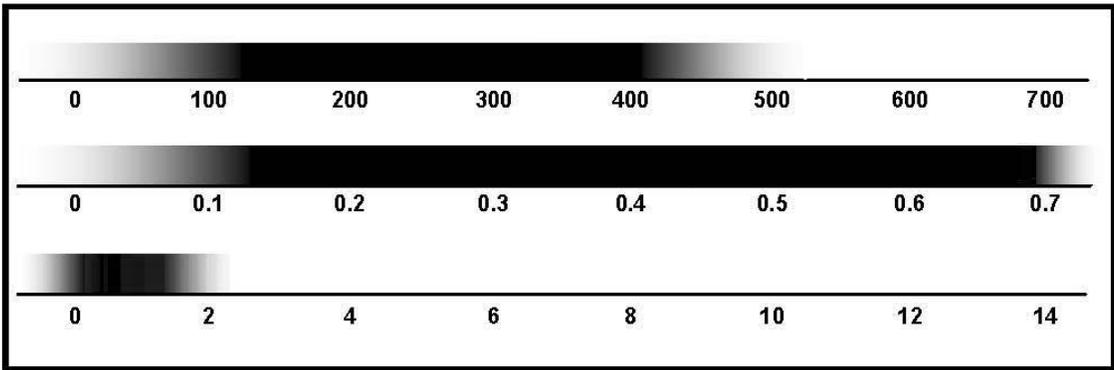


I. Current Status and Distribution *Ottelia alismoides*

a. Range	Global/Continental	Wisconsin
Native Range Africa, India, Southwest Pacific ¹	 <p style="text-align: center;">Figure 1: U.S and Canada Distribution Map²</p>	Not recorded in Wisconsin
Abundance/Range Widespread: Locally Abundant: Sparse:	Not considered top invasive plant ³ Slow moving or still waters ^{4,5} Florida ³ ; eradicated in California ⁶ ; threatened in Japan and China ^{8,19,20}	Not applicable Not applicable Not applicable
Range Expansion Date Introduced: Rate of Spread:	Louisiana, 1969 ⁴ Slow to spread ³ ; a long-established colony in Louisiana still only 18m ² (6)	Not applicable Not applicable
Density Risk of Monoculture: Facilitated By:	Undocumented Populations believed to remain localized ⁶	Unknown Unknown

b. Habitat	Streams, lakes, marshes, ponds, ditches, canals, rice fields ^{1,4,7}
Tolerance	Chart of tolerances: Increasingly dark color indicates increasingly optimal range



Preferences	Slow moving streams and stagnant pools ^{1,8} ; muddy substrate ¹ ; eutrophic conditions ^{8,10} ; low salinity ³ ; constant water levels ⁶
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c. Regulation	
Noxious/Regulated ² :	Federal Noxious Weed List; AL, CA, MA, NC, OR, SC, VT
Minnesota Regulations:	<i>Prohibited</i> ; One may not possess, import, purchase, propagate, or transport
Michigan Regulations:	<i>Not regulated</i>
Washington Regulations:	<i>Not regulated</i>
II. Establishment Potential and Life History Traits	
a. Life History	Submersed or emergent aquatic annual herb ⁶ (or perennial from attached basal rosettes) ⁹
Fecundity	High; numerous seed set but populations usually localized ^{6,8}
Reproduction	Sexual; highly self-compatible, occasionally cleistogamous ⁹
Importance of Seeds:	High and infallible; autogamous with high reproduction allocation ^{8,10}
Vegetative:	None ^{6,9}
Hybridization	Undocumented
Overwintering	
Winter Tolerance:	Seed germination in China is promoted by a 5-month cold period ²¹
Phenology:	In Japan, emerges early June, with peak biomass in September ⁸
b. Establishment	
Climate	
Weather:	Tropical and warmer regions ^{8,10}
Wisconsin-Adapted:	Uncertain
Climate Change:	Likely to facilitate growth and distribution
Taxonomic Similarity	
Wisconsin Natives:	Medium; family Hydrocharitaceae
Other US Exotics:	Medium; family Hydrocharitaceae
Competition	
Natural Predators:	Undocumented
Natural Pathogens:	<i>Macrophomina phaseolina</i> (Tassi) Goid. (fungus) ¹¹
Competitive Strategy:	Extreme morphological variability ⁸
Known Interactions:	Undocumented
Reproduction	
Rate of Spread:	Described as slow ³
Adaptive Strategies:	High reproductive allocation ⁸
Timeframe	Undocumented
c. Dispersal	
Intentional:	Aquarium trade, ornamental use, allelopathic control programs
Unintentional:	Wind, water, animals, humans; possibly fish ¹⁰
Propagule Pressure:	Undocumented; no vegetative spread, seeds must be introduced



Figure 2: Courtesy of H. Barth Dessau, Bugwood.org¹²
 Figure 3: Courtesy of J.M. Garg, Wikimedia Commons¹³

III. Damage Potential

a. Ecosystem Impacts

Composition	Ecosystem effects largely undocumented
Structure	Forms dense colonies along ditch banks and irrigation canals, impeding water flow ⁴ ; likely architectural impact as a result of dense colonies
Function	Undocumented
Allelopathic Effects	Kills <i>Eichhornia crassipes</i> (water hyacinth) plants within 3 weeks ¹⁴
Keystone Species	Undocumented
Ecosystem Engineer	Possible if growing as monoculture
Sustainability	Undocumented
Biodiversity	Undocumented
Biotic Effects	Undocumented
Abiotic Effects	Undocumented
Benefits	May serve as habitat; allelopathic effect on <i>Eichhornia crassipes</i>

b. Socio-Economic Effects

Benefits	Isolates show <i>in vitro</i> cytotoxicity against various cancer lines ¹⁵ ; extracts may inhibit human tubercular bacteria ¹⁶ ; extracts may be beneficial in treatment of fish parasites ¹⁷ ; edible plant
Caveats	Risk of release and population expansion outweighs benefits of use
Impacts of Restriction	Increase in monitoring, education, and research costs
Negatives	Directly or indirectly injurious to agricultural interests (impedes irrigation water flow) ^{4,18} ; can impede with navigation of small boats ¹⁸
Expectations	More negative impacts can be expected in eutrophic, low-energy, mud-bottomed systems ^{1,8}
Cost of Impacts	Decreased recreational and aesthetic value; decline in ecological integrity; increased research expenses
“Eradication” Cost	Undocumented

IV. Control and Prevention

a. Detection

Crypsis:	Medium; confused with <i>Echinodorus berteroi</i> ; other floating leaved species; extreme variability in morphology ⁸
Benefits of Early Response:	Undocumented

b. Control	
Management Goal 1	Nuisance relief
Tool:	Hand-pulling and chemical treatment
Caveat:	Labor-intensive; non-target plant species can be negatively impacted
Cost:	Undocumented
Efficacy, Time Frame:	Undocumented, but reported success in a few areas
Tool:	Chemical (butachlor) ²²
Caveat:	Drastic negative effects on zooplankton, fish, and non-target plants
Cost:	Undocumented
Efficacy, Time Frame:	Plant decayed within a week with 2.5-7.5 L a.i./ha/m butachlor

¹ US Forest Service, Pacific Island Ecosystems at Risk (PIER). 2006. *Ottelia alismoides* (L.) Pers., Hydrocharitaceae. Retrieved December 28, 2010 from: http://www.hear.org/pier/species/ottelia_alismoides.htm

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⁴ Medley, T. 1995. Noxious weeds; deletions and additions to list. 60 FR 15260. 7 CFR Part 360 Docket No. 94-050-1. Retrieved October 19, 2010 from: <http://www.federalregister.gov/articles/1995/07/12/95-17018/noxious-weeds-deletions-and-additions-to-list>

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¹³ Garg, J.M. 2009. Wiki Commons. Retrieved October 19, 2010 from: http://upload.wikimedia.org/wikipedia/commons/d/d1/Ottelia_alismoides_W_IMG_0775.jpg

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