

Part IV. Plant Assessment Form

For use with “Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands”
by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association

Electronic version, February 28, 2003

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Myriophyllum spicatum L.
Synonyms:	none
Common names:	spike watermilfoil
Evaluation date (mm/dd/yy):	3/28/05
Evaluator #1 Name/Title:	Elizabeth Brusati, project manager
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Section below for list committee use—please leave blank

List committee members:	Joe DiTomaso, Alison Stanton, Joanna Clines, Cynthia Roye, Doug Johnson
Committee review date:	7/8/05
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

enter text here

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	A	Other Pub. Mat'l
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	A	Other Pub. Mat'l
1.4	Impact on genetic integrity	U	Other Pub. Mat'l

<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>AAAU</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>A</p>

2.1	Role of anthropogenic and natural disturbance	A (3 pts)	Other Pub. Mat'l
2.2	Local rate of spread with no management	A (3 pts)	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B (2 pts)	Observational
2.4	Innate reproductive potential Wksht A	A (3 pts)	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A (3 pts)	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A (3 pts)	Other Pub. Mat'l
2.7	Other regions invaded	C (1 pt)	Other Pub. Mat'l

<p>Invasiveness</p> <p><i>Enter the sum total of all points for Q2.1-2.7 below:</i></p> <p>17</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>A</p>
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<p>Plant Score</p> <p><i>Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:</i></p> <p>High</p> <p>No Alert</p>

3.1	Ecological amplitude/Range	C	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	B	Observational

<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</p>

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify ecosystem processes impacted: Forms large surface or subsurface mats that impede waterflow (1). Dense canopies result in reduced oxygen exchange, increased nutrient loading, and increased water temperatures. There is concern that watermilfoil might mobilize phosphorous in Lake Tahoe, which is currently phosphorous limited, contributing to the loss of clarity in the lake (2).</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421. 2. Donaldson, S. 1997. Flood-borne noxious weeds: impacts on riparian areas and wetlands. Proceedings of the California Exotic Pest Plant Council Symposium. 3:7 Available: http://groups.ucanr.org/ceppc/Symposia/</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Large mats displace native aquatic vegetation.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Large floating mats create mosquito habitat and impede recreational activities (1). Provides calm water for waterfowl, but simultaneously outcompetes native vegetation that supports waterfowl. One study in New York found that as watermilfoil cover increased from 35% to 97%, the total number of plant species dropped from 21 to 9 (2). Tends to have larger negative effects on predatory species than on small forage fishes. Can also decrease the quantity and quality of recreational activities such as angling, boating, swimming, and waterskiing. It is reasonable to expect that colonization of Eurasian watermilfoil at sites in the Lake Tahoe watershed yield annual damages of at least several hundred thousand to a few million dollars (3).</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421. 2. Donaldson, S. 1997. Flood-borne noxious weeds: impacts on riparian areas and wetlands. Proceedings of the California Exotic Pest Plant Council Symposium. 3:7 Available: http://groups.ucanr.org/ceppc/Symposia/ 3. Eiswerth, M. E., S. G. Donaldson, and W. S. Johnson. 2000. Potential environmental impacts and economic damages of Eurasian watermilfoil (<i>Myriophyllum spicatum</i>) in western Nevada and northeastern California. Weed Technology. 14:511-518</p>	

Question 1.4 Impact on genetic integrity	U No Information back
Identify impacts: There are three native species of <i>Myriophyllum</i> in California, but no information on hybridization.	
Rationale: enter text here	
Sources of information: Hickman, J. C. (ed.) 1993. The Jepson Manual, Higher Plants of California. University of California Press. Berkeley, CA enter text here	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: Inhabits both areas with natural disturbance, such as river channels, and calmer waters with less disturbance (1).	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: Forms long vines that can grow to four times the original size in one year. Populations in the Tahoe Keys expanded by as much as three times in one year (1).	
Rationale: enter text here	
Sources of information: 1. Donaldson, S. 1997. Flood-borne noxious weeds: impacts on riparian areas and wetlands. Proceedings of the California Exotic Pest Plant Council Symposium. 3:7 Available: http://groups.ucanr.org/ceppc/Symposia/	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: So widespread that it is probably still spreading by not as rapid as in past.	
Rationale: enter text here	
Sources of information: DiTomaso, observational.	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics: Reproduces vegetatively by rhizomes, stem fragments, and axillary buds. Axillary buds detach readily. Male and female flowers develop on the same plant. In California, seed production is much less important than vegetative production. Some populations produce many seeds, but seedlings are rarely observed. Seeds can survive at least seven years under dry conditions. At maturity, fruits	

detach and float for a period before sinking (1).	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Escaped from aquaria. Can be spread by dumping of aquarium water or by catching in boat propellers.	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Can cling to the feet and feathers of waterbirds or be carried downstream by waterflow, especially during winter floods. Waterbirds eat and disperse seeds. Easily fragmented and moved downstream.	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: Present in almost every U.S. state (1, 2). Typically inhabits temperate regions in the northern hemisphere but can also live in subtropical to tropical areas (2).	
Rationale: Scoring as C because seems to inhabit the same habitats elsewhere as it does in California.	
Sources of information: 1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.	
Question 3.1 Ecological amplitude/Range	C Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Present in ponds, lakes, rivers, streams, canals, and ditches. Usually in still or slow-moving water but occasionally found in faster-moving water of streams and rivers. Present in the central-western region,	

<p>San Joaquin Valley, southern Sacramento Valley, and both the California and Nevada sides of Lake Tahoe, to 150m. Inhabits a wide range of environmental conditions. Often grows in hard alkaline water up to 3m deep, but can survive in water up to 8m deep if it is very clear with high light penetration. Tolerates a broad pH range (5.4 - 11), brackish water, and sandy to acid-peat substrates (1).</p> <p>Where water evaporates slowly and the plants are gradually stranded, Eurasian watermilfoil can develop a land form (2).</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: 1. DiTomaso, J.M., and E. H. Healy. 2003. Aquatic and Riparian Weeds of the West. University of California, Agriculture and Natural Resources Publication 3421.</p> <p>2. Anonymous. 2005. Eurasian watermilfoil (<i>Myriophyllum spicatum</i> L.). Written findings of the Washington State Noxious Weed Control Board. Available: http://www.nwcb.wa.gov/weed_info/Written_findings/</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>B Observational back</p>
<p>Describe distribution: Probably most common submerged aquatic weed in California. Very widespread.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: DiTomaso, observational.</p>	

Worksheet A[back](#)

Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	No: 0 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	No: 0 pt
Seeds remain viable in soil for three or more years	Yes: 2 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	Yes: 2 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	8 pts Total Unknowns
	A (6+ pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

[back](#)

(*sensu* Holland 1986)

Major Ecological Types	Minor Ecological Types	Code*
Marine Systems	marine systems	score
Freshwater and Estuarine Aquatic Systems	lakes, ponds, reservoirs	B. 21-50%
	rivers, streams, canals	D. present
	estuaries	score
Dunes	coastal	score
	desert	score
	interior	score
Scrub and Chaparral	coastal bluff scrub	score
	coastal scrub	score
	Sonoran desert scrub	score
	Mojavean desert scrub (incl. Joshua tree woodland)	score
	Great Basin scrub	score
	chenopod scrub	score
	montane dwarf scrub	score
	Upper Sonoran subshrub scrub	score
	chaparral	score
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	score
	valley and foothill grassland	score
	Great Basin grassland	score
	vernal pool	score
	meadow and seep	score
	alkali playa	score
	pebble plain	score
Bog and Marsh	bog and fen	score
	marsh and swamp	score
Riparian and Bottomland	riparian forest	score
	riparian woodland	score
	riparian scrub (incl. desert washes)	score
Woodland	cismontane woodland	score
	piñon and juniper woodland	score
	Sonoran thorn woodland	score
Forest	broadleaved upland forest	score
	North Coast coniferous forest	score
	closed cone coniferous forest	score
	lower montane coniferous forest	score
	upper montane coniferous forest	score
	subalpine coniferous forest	score
Alpine Habitats	alpine boulder and rock field	score
	alpine dwarf scrub	score

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).