

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 aquaticum (Vell. Conc. Verdc.)
Synonyms:	Enhydrya aquatica, Myriophyllum brasiliense, M. proserpinacoides
Common names:	parrotfeather, Brazilian watermilfoil, parrotfeather watermilfoil, thread-of-life,
Evaluation date (mm/dd/yy):	3/28/05
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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	B	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>AABD</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)	Observational
2.3	Recent trend in total area infested within state	B (2 pts)	Observational
2.4	Innate reproductive potential Wksht A	B (2 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	B (2 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>16</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>B</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 Red Alert</p>
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3.1	Ecological amplitude/Range	C	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	D	Observational

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

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes A Other Pub. Mat'l back</p> <p>Identify ecosystem processes impacted: Forms large surface or subsurface mats that impede waterflow.</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 1.2 Impact on plant community composition, structure, and interactions 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 B Other Pub. Mat'l back</p> <p>Identify type of impact or alteration: Large floating mats create mosquito habitat and impede recreational activities (1). Can shade out algae that serve as the basis of the aquatic food web (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. Parrotfeather (<i>Myriophyllum aquaticum</i> (Vell.) Verdc.). Written findings of the Washington State Noxious Weed Control Board. Available: http://www.nwcb.wa.gov/weed_info/written_findings/</p>
<p>Question 1.4 Impact on genetic integrity D Other Pub. Mat'l back</p> <p>Identify impacts: There are three native species of <i>Myriophyllum</i> in California, but this species does not produce any seed and is extremely unlikely to hybridize with the natives.</p> <p>Rationale: enter text here</p> <p>Sources of information: Hickman, J. C. (ed.) 1993. The Jepson Manual, Higher Plants of California. University of California Press. Berkeley, CA</p> <p>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>

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). Can survive drawdowns of water in irrigation channels (2). Appears to be adapted to high nutrient environments (2).	
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. 2. Anonymous. 2005. Parrotfeather (<i>Myriophyllum aquaticum</i> (Vell.) Verdc.). Written findings of the Washington State Noxious Weed Control Board. Available: http://www.nwcb.wa.gov/weed_info/written_findings/	
Question 2.2 Local rate of spread with no management	A Observational back
Describe rate of spread: Has been observed to spread very rapidly in most aquatic systems.	
Rationale: enter text here	
Sources of information: DiTomaso and Anderson, observational.	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: Still spreading.	
Rationale: enter text here	
Sources of information: DiTomaso, observational.	
Question 2.4 Innate reproductive potential	B Other Pub. Mat'l back
Describe key reproductive characteristics: Only populations in native range develop seeds. Creeping rhizomes produce numerous roots at nodes. Stems develop fine adventitious roots at lower nodes and on stem fragments. Male and female flowers develop on separate plants. Cultivated and naturalized plants in California are typically female (1). Rhizomes stored in a refrigerator for one year were able to regenerate (2).	
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 2. Anonymous. 2005. Parrotfeather (<i>Myriophyllum aquaticum</i> (Vell.) Verdc.). Written findings of the Washington State Noxious Weed Control Board. Available:	

http://www.nwcb.wa.gov/weed_info/written_findings/	
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	B Other Pub. Mat'l back
Identify dispersal mechanisms: Can cling to the feet and feathers of waterbirds or be carried downstream by waterflow.	
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: Native to South America. Present along the west coast, in the southeast, and along the Atlantic seaboard (1). Inhabits warm temperate to tropical regions worldwide but is not as widespread as Eurasian watermilfoil (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: Introduced from South America as a pond ornamental in the late 1800s to early 1900s. Grows best in tropical regions, can survive freezing by becoming dormant. Typically in water to 1.5m deep. Tolerates soft to very hard water and a pH range of 5.5 to 9.0. Does not tolerate brackish water. Requires high light conditions. Occurs in ponds, lakes, rivers, streams, canals, and ditches. Usually lives in still or slow-moving water, but occasionally in faster-moving water of streams and rivers. Occurs in North Coast, Cascade Range foothills, central-western region, and south coast to 500m (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 3.2 Distribution/Peak frequency	D Observational back
Describe distribution: Mainly in irrigation canals and in some ponds. Not as common as Eurasian watermilfoil	
Rationale: enter text here	
Sources of information: DiTomaso, observational	

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.	No: 0 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	No: 0 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
	5 pts
	Total Unknowns
	B (4-5 pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

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(*sensu* Holland 1986)

Major Ecological Types	Minor Ecological Types	Code*
Marine Systems	marine systems	score
Freshwater and Estuarine Aquatic Systems	lakes, ponds, reservoirs	D. present
	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).