Part IV. Plant Assessment Form

For use with "Criteria for Categorizing Invasive Non-Native Plants that Threaten Colorado's Wildlands, Economy, and Ecology"
By the Colorado Noxious Weed Advisory Committee

Electronic version, March 28, 2007

Table 1. Species and Evaluator Information

Species name (Latin binomial)**:**	Polygonum cuspidatum Sieb. and Zucc.
Synonyms:	Reynoutria japonica, Fallopia baldschuanica
Common names:	Japanese knotweed, Mexican bamboo
Evaluation date (mm/dd/yy)**:**	6/20/08
Evaluator #1 Name/Title:	Dr. Scott Nissen, Professor
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Evaluator #2 Name/Title:	enter text here
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Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
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	**B**	**Other Pub. Mat'l**
1.2	Impact on plant community	**A**	**Rev'd, Sci. Pub'n**
1.3	Impact on higher trophic levels	**B**	**Other Pub. Mat'l**
1.4	Impact on genetic integrity	**C**	**Other Pub. Mat'l**

Impact

Enter four characters from Q1.1-1.4 below:

BABC

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	**B (2 pts)**	**Other Pub. Mat'l**
2.2	Local rate of spread with no management	**B (2 pts)**	**Anecdotal**
2.3	Recent trend in total area infested within state	**B (2 pts)**	**Anecdotal**
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	**A (3 pts)**	**Other Pub. Mat'l**
2.7	Other regions invaded	**A (3 pts)**	**Other Pub. Mat'l**

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

17

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Medium

Red Alert

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

Distribution

Using matrix, determine score and enter below:

C

4.1	Poisonous to livestock	**U**	**No Information**
4.2	Detrimental to economic crops	**U**	**No Information**

4.3	Detrimental to management of agricultural system, rangeland and pasture	**U**	**No Information**
4.4	Human health impacts	**U**	**No Information**
4.5	Impact to property values	**A**	**Other Pub. Mat'l**
4.6	Impact to recreational values	**B**	**Other Pub. Mat'l**
4.7	Economic value of species/impact of listing to industry	**D**	**Anecdotal**

Ag/ Human Impacts
Total Points:
2
Score:
D

Agriculture Plant Score
Overall Score:
High
Alert Status:
Red Alert

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l
Identify ecosystem processes impacted: Can decrease water flow and increase erosion, though impacts are not typically severe (1,2).	
Rationale: Thickets can clog smaller water ways and flood plains. Creates bank erosion issues, and is considered to be a flood control hazard.	
Sources of information: 1. Anonymous. 2005. Invasive Knotweeds. Kind County (Washington) Noxious Weed Control Program Weed Alert. King County Department of Natural Resources and Parks, Water and Land Resources Division, Noxious Weed Control Program. Available: http://dnr.metrokc.gov/weeds. 2. John Randall, The Nature Conservancy, Personal Observation.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd, Sci. Pub'n
Identify type of impact or alteration: Creates dense infestations that physically exclude other vegetation (1).	
Rationale: Knotweeds typically emege early in the growing season and can grow rapidly up to 4 m in height, allowing them to shade out other species and prevent revegetation (2).	
Sources of information: 1. DiTomaso and Healy. 2006. Weeds of California. UC DANR Publication # 3488. 2. Seiger, L. 1991. Element Stewardship Abstract for Polygonum cuspidatum. The Nature Conservancy, Arlington, VA. Available: http://tncweeds.ucdavis.edu.	
Question 1.3 Impact on higher trophic levels	B Other Pub. Mat'l
Identify type of impact or alteration: Decreases value of riparian habitat for fish and wildlife (1). Knotweed litter has a higher carbon-to-nitrogen ratio than native plants normally found in such habitats, giving it less nutritional value for aquatic insects that native species such as alder, willows or cottonwood (2).	
Rationale: Dense stands of knotweed can clog smaller waterways, blocking the passage of fish as well as access to water for larger mammals. Due to its lower nutritional value for herbivores and detritivores patches of knotweed will likely not support the same diversity and abundance of insects and wildlife than native plant species it displaces (2).	
Sources of information: 1. Shaw, R, L Seiger. 2002. Japanese knotweed. In Van Driesche, R, et al. Biological Control of Invasive Plants in Eastern United States. USDA Forest Service Publication FHTET-2002-04. 2. Urgenson, L. Graduate student, University of Washington. Personal communication to E Brusati, Cal-IPC, 2/28/05.	
Question 1.4 Impact on genetic integrity	C Other Pub. Mat'l
Identify impacts: There are a number of introduced Polygonum species in Colorado, and several that are native; thus far no known hybrids have appeared in Colorado (1).	

Rationale: Although Japanese knotweed reproduces primarily by vegetative means, production of viable seeds is known for several N American populations, and hybridization between P cuspidatum and congeneric species has been documented (2,3).

Sources of information: 1. Weber, W, R Wittmann. 2000. Catalog of the Colorado Flora: A Biodiversity Baseline. Boulder, CO: University Press of Colorado. Electronic version, rev. 3/11/00. Available: http://cumuseum.colorado.edu/Research/Botany/Databases/catalog.html.

2. Child, L, Max Wade. 2000. The Japanese Knotweed Manual. Chichester, UK: Packard Pulishing Ltd.

3. Gammon, M, J Grimsby, D Tsirelson, R Kesseli. 2007. Molecular and morphological evidence reveals introgression in swarms of the invasive taxa Fallopia japonica, F sachalinensis, and F x bohemica (Polygoanceaea) in the United States. American Journal of Botany 94(6): 948-956.

Question 2.1 Role of anthropogenic and natural disturbance in establishment B Other Pub. Mat'l

Describe role of disturbance: Japanese knotweed is most successful at sites with moderate disturbance levels, such as riparian areas, forest edges, along roadsides, and in urban habitats. Infestations do not typically inhabit undistrubed forests or grasslands (1).

Rationale: Some level of disturbance, either anthropogenic or natural, seems necessary for knotweed establishment. Spread of the species is often linked to anthropogenic disturbance and transport, such as fragmentation of rhizomes by construction equipment that is then transported to another site (2).

Sources of information: 1. Child, L, M Wade. 2002.

2. C Douglass, Personal Communication.

Question 2.2 Local rate of spread with no management B Anecdotal

Describe rate of spread: Rate of spread is difficult to determine as it is unclear as to when populations were established. Currently, Japanese knotweed is limited in its distribution and occurence, but there is high potential for it to spread into other suitable habitats (1).

Rationale: enter text here

Sources of information: 1. C Andrews (Colorado Department of Agriculture), G Beck (Colorado State University). Personal communication.

Question 2.3 Recent trend in total area infested within state B Anecdotal

Describe trend: From available antecdotal information it appears that Japanese knotweed sites in Colorado have remained limited to the banks of the Clear Creek and isolated locations in the city of Boulder (1). However, it must be stressed that given the ease with which the species is transported through natural and human-mediated disturbances the total area infested could rise rapidly.

Rationale: enter text here

Sources of information: 1. C Andrews (Colorado Department of Agriculture), G Beck (Colorado State University). Personal communication.
Question 2.4 Innate reproductive potential B Other Pub. Mat'l
Describe key reproductive characteristics: P cuspidatum is a rapidly-growing perennial that establishes substantial root systems. Reproduction occurs primarily through rhizomes, and the plants can spread through fragmented rhizomes (1). Production of viable seeds is only known for limited populations in the NE United States (2).
Rationale: enter text here
Sources of information: 1. DiTomaso and Healy. 2006. 2. Gammon et al. 2007.
Question 2.5 Potential for human-caused dispersal A Other Pub. Mat'l
Identify dispersal mechanisms: Japanese knotweed was originally introduced into N America as an ornamental species (1). Although infestations are typically densest in riparian regions, increasingly the species is known in the NE United States and United Kingdom as a roadside weed spread via rhizome fragments that collect on vehicles and heavy machinery (2,3).
Rationale: enter text here
Sources of information: 1. Tu, M, J Randall. 2003. 2003 Cal-IPC Red Alert! Proceedings of the California Invasive Plant Council Symposium. Available: http://www.cal-ipc.org. 2. C Douglass, Personal communication. 3. Child, L, M Wade. 2002.
Question 2.6 Potential for natural long-distance dispersal A Other Pub. Mat'l
Identify dispersal mechanisms: Knotweed rhizomes fragment readily and can be carried great distances by water (1).
Rationale: enter text here
Sources of information: 1. DiTomaso and Healy 2006.
Question 2.7 Other regions invaded A Other Pub. Mat'l
Identify other regions: Japanese knotweed is a major invasive species problem in the NE, NW and northern Midwest United States, as well as throughout the United Kingdom (1,2).

Rationale: The species currently invades habitats in other regions of the US that are present but not extensively affected in Colorado, such as roadsides, wetlands, marshes and riparian forests.
Sources of information: 1. Seiger 1991 2. Holllingsworth, M, J Bailey. 2000. Evidence for massive clonal growth in the invasive weed Fallopia japonica (Japanese knotweed). Botanical Journal of the Linean Society 133: 463-472.
Question 3.1 Ecological amplitude/Range B Other Pub. Mat'l
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: A recent invader in Colorado and not currently widespread. Knotweed is known to be successful along roadsides, throughout riparian areas, in wetlands, and in urban areas or other disturbed sites with adequate moisture (1). In Colorado the largest currently known infestations are along Clear Creek at sites in Adams, Jefferson and Boulder counties (2).
Rationale: Infested sites in Colorado are known to be along Clear Creek, but there are also several known patches in the city of Boulder.
Sources of information: 1. Seigler 2001 2. C Andrews (Colorado Department of Agriculture), G Beck (Colorado State University). Personal communication.
Question 3.2 Distribution/Peak frequency D Anecdotal
Describe distribution: Distribution of Japanese knotweed in Colorado is currently limited (1)
Rationale: enter text here
Sources of information: 1. C Andrews (Colorado Department of Agriculture), G Beck (Colorado State University). Personal communication.
Question 4.1 Poisonous to Livestock U No Information
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: No published information.
Rationale: enter text here
Sources of information: enter text here
Question 4.2 Detrimental to Economic Crops U No Information
Describe impacts to all aspects of cropping systems (see guidelines): Japanese knotweed does not typically occur in agronomic habitats.

Rationale: enter text here
Sources of information: enter text here
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture U No Information
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: No published information.
Rationale: enter text here
Sources of information: enter text here
Question 4.4 Human Health Impacts U No Information
Describe features such as irritants (sap), spines, poisonous, and smoke impacts: No human health impacts are currently reported from contact with intact or damaged knotweed plants.
Rationale: enter text here
Sources of information: enter text here
Question 4.5 Impact to Property Values A Other Pub. Mat'l
Describe impacts such as decreased value of land for crop and/or forage production, and/or increased risk of fire: Japanese knotweed is very expensive to control and manage, thus for both private and public landowners knotweed infestations could lower property values (1).
Rationale: enter text here
Sources of information: 1. Child, L, M Wade. 2002.
Question 4.6 Impact to Recreational Values B Other Pub. Mat'l
Identify decreased value of land for camping, biking, boating, and other recreational uses; e.g., tamarisk makes it more difficult for people to use shoreline for camping and fishing): Dense knotweed stands along rivers and streams can make it very difficult for recreational users to access the waterways. Increased erosion and debris levels in infested riparian areas could also impact the quality of recreational resources (1,2).
Rationale: enter text here

Sources of information: 1. Child, L, M Wade. 2002. 2. C Douglass, Personal communication.
Question 4.7 Economic Value of Species/ Impact of Listing to Industry D No Information
Describe financial impacts to agriculture, horticulture and/or nursery, seeds: Horticultural sales of Japanese knotweed is not known to be common at present date.
Rationale: enter text here
Sources of information: enter text here

Worksheet A

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/No?**
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	**Unknown: 0 pts**
Viable seed produced with *both* self-pollination and cross-pollination	**Unknown: 0 pts**
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 2 unknowns
	B (4-5 pts)
Note any related traits: enter text here	

Worksheet B - Colorado Ecological Types and Land Use

(*sensu* Holland 1986)

Major Ecological and Land Use Types	Minor Ecological and Land Use Types	Code*
Freshwater and Aquatic Systems	lakes, ponds, reservoirs	**score**
	rivers, streams, canals	**score**
Riparian and wetlands	Riparian forest	**D. present**
	Riparian shrublands	**D. present**
	Wet meadows	**score**
Grasslands	Shortgrass prairie	**score**
	Tallgrass prairie	**score**
	Sandsage prairie	**score**
	Montane meadows	**score**
Irrigated Agriculture	Hay meadows	**score**
	Irrigated crops (alfalfa, corn, sugar beets)	**score**
Dryland Agriculture	Dryland crops (wheat, corn, millet, dryland grass hay, sunflowers, mustard for biodiesel)	**score**
Developed Lands	Urban, exurban, industrial	**D. present**
Arid Shrublands	Sagebrush shrublands	**score**
	Foothills shrublands	**score**
	Gambel oak shrublands	**score**
Woodlands	Pinyon - juniper	**score**
	Ponderosa pine	**score**
	Limber pine	**score**
Forest	Lodgepole pine	**score**
	Spruce-fir	**score**
Alpine	Boulder and rock fields	**score**
	Dwarf shrublands	**score**
	Tundra	**score**
Barrens (lower elevation)	Dunes	**score**
	Rock outcrops	**score**
	Canyonlands	**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).