

Part IV. Plant Assessment Form

For use with “Criteria for Categorizing Invasive Non-Native Plants that Threaten Colorado’s Wildlands and Agriculture”
By the Colorado Noxious Weed Advisory Committee

Electronic version: December 4, 2008

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Caragana arborescens Lam.
Synonyms:	
Common names:	Siberean Peashrub, Siberean Peatree, Caragana
Evaluation date (mm/dd/yy):	4-20-10
Evaluator #1 Name/Title:	Michael Ostlie
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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	C	Rev'd, Sci. Pub'n	<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>CBDD</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</p>	<p>Wildlands Plant Score</p> <p><i>Using matrix, determine Overall Score and Alert Status from the first, second, and third section scores and enter below:</i></p> <p>Moderate</p> <p>No Alert</p>
1.2	Impact on plant community	B	Rev'd, Sci. Pub'n		
1.3	Impact on higher trophic levels	D	Anecdotal		
1.4	Impact on genetic integrity	D	Rev'd, Sci. Pub'n		
2.1	Role of anthropogenic and natural disturbance	B (2 pts)	Rev'd, Sci. Pub'n	<p>Invasiveness</p> <p><i>Enter the sum total of all points for Q2.1-2.7 below:</i></p> <p>11</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>B</p>	
2.2	Local rate of spread with no management	C (1 pt)	Other Pub. Mat'l		
2.3	Recent trend in total area infested within state	C (1 pt)	Other Pub. Mat'l		
2.4	Innate reproductive potential Wksht A	B (2 pts)	Rev'd, Sci. Pub'n		
2.5	Potential for human-caused dispersal	B (2 pts)	Other Pub. Mat'l		
2.6	Potential for natural long-distance dispersal	C (1 pt)	Other Pub. Mat'l		
2.7	Other regions invaded	B (2 pts)	Rev'd, Sci. Pub'n		
3.1	Ecological amplitude/Range	A	Other Pub. Mat'l	<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</p>	
3.2	Distribution/Peak frequency Wrksht B	D	Other Pub. Mat'l		

4.1	Poisonous to livestock	D (0 pts)	Anecdotal
4.2	Detrimental to economic crops	D (0 pts)	Anecdotal
4.3	Detrimental to management of agricultural system, rangeland and pasture	C (1 pt)	Rev'd, Sci. Pub'n
4.4	Human impacts Wrksht C	C (1 pt)	Other Pub. Mat'l

Agricultural / Human Impact

Enter the sum total of all points for Q4.1-4.4 below:

2

Use matrix to determine score and enter below:

C

Agricultural Plant Score

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

Limited

No Alert

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>C Rev'd, Sci. Pub'n back</p>
<p>Identify ecosystem processes impacted: This plant decreases light quality for surrounding plants and reduces nearby tree/shrub regrowth. This plant is also a woody legume.</p>	
<p>Rationale: The legumous nature of this species could have both positive and negative effects on a plant community, depending on the desired species.</p>	
<p>Sources of information: 1. Henderson, D., and R. Chapman. 2006. Caragana Arborescens Invasion in Elk Island National Park, Canada. Natural Areas Journal. 26:261-266. 2. Hensley, D. and P. Carpenter. 1979. The Effect of Temperature on N₂ Nixation (C₂H₂ Reduction) by Nodules of Legume and Actinomycete-Nodulated Woody Species. Botanical Gazette. 140:S58-S64.</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>B Rev'd, Sci. Pub'n back</p>
<p>Identify type of impact or alteration: This plant can reduce available light to nearby plants and increase nitrogen content to nearby plants.</p>	
<p>Rationale: Productivity, and germination/regeneration can be decreased in native populations of trees if this species increases in abundance. It may also increase the abundance of other invading plants who tend to prefer higher nitrogen environments.</p>	
<p>Sources of information: 1. Henderson, D., and R. Chapman. 2006. Caragana Arborescens Invasion in Elk Island National Park, Canada. Natural Areas Journal. 26:261-266. 2. Hensley, D. and P. Carpenter. 1979. The Effect of Temperature on N₂ Nixation (C₂H₂ Reduction) by Nodules of Legume and Actinomycete-Nodulated Woody Species. Botanical Gazette. 140:S58-S64. 3. Alaska Natural Heritage Program. 2006. Siberian Peashrub Caragana Arborescens Lam. Non-Native Plant Species of Alaska.</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>D Anecdotal back</p>
<p>Identify type of impact or alteration: none noted.</p>	
<p>Rationale:</p>	
<p>Sources of information:</p>	
<p>Question 1.4 Impact on genetic integrity</p>	<p>D Rev'd, Sci. Pub'n back</p>
<p>Identify impacts: none noted</p>	
<p>Rationale: hybridization is unlikely since there are no apparent close native relatives.</p>	

Sources of information: 1. Zhang, M., P. Fritsch, and B. Cruz. 2009. Phylogeny of Caragana (Fabaceae) Based on DNA Sequence Data from rbcL, trnS-trnG, and ITS. <i>Molecular Phylogenetics and Evolution</i> . 50:547-559.	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Rev'd, Sci. Pub'n back
Describe role of disturbance: The plant can quickly fill in gaps created in forested areas.	
Rationale: The plant can quickly spread to an open area and shade out other herbaceous species trying to grow in that area.	
Sources of information: 1. Henderson, D., and R. Chapman. 2006. Caragana Arborescens Invasion in Elk Island National Park, Canada. <i>Natural Areas Journal</i> . 26:261-266.	
Question 2.2 Local rate of spread with no management	C Other Pub. Mat'l back
Describe rate of spread: Relatively slow.	
Rationale: Colorado is on the southern boundary of suitable habitat. There are currently no large-scale management practices in affect and no dense infestations have been reported.	
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 2.3 Recent trend in total area infested within state	C Other Pub. Mat'l back
Describe trend: There does not seem to be a noticable increase in the abundance of this species in Colorado.	
Rationale:	
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 2.4 Innate reproductive potential	B Rev'd, Sci. Pub'n back
Describe key reproductive characteristics: This plant reproduces via seeds, and root cuttings.	
Rationale: It has been reported that 50 individuals were planted 75 years ago, and in 2006 that population had grown to 60,000 (2).	
Sources of information: 1. Alaska Natural Heritage Program. 2006. Siberian Peashrub Caragana Arborescens Lam. <i>Non-Native Plant Species of Alaska</i> . 2. Henderson, D., and R. Chapman. 2006. Caragana Arborescens Invasion in Elk Island National Park, Canada. <i>Natural Areas Journal</i> . 26:261-266.	

Question 2.5 Potential for human-caused dispersal	B Other Pub. Mat'l back
Identify dispersal mechanisms: This plant is sold as an ornamental due to its winter-hardiness and potential use as a windbreak.	
Rationale:	
Sources of information: 1. Alaska Natural Heritage Program. 2006. Siberian Peashrub <i>Caragana Arborescens</i> Lam. Non-Native Plant Species of Alaska.	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
Identify dispersal mechanisms: This plant produces many seeds in pods.	
Rationale: The seeds produced are large and would be difficult to transport over large distances.	
Sources of information: 1. Alaska Natural Heritage Program. 2006. Siberian Peashrub <i>Caragana Arborescens</i> Lam. Non-Native Plant Species of Alaska.	
Question 2.7 Other regions invaded	B Rev'd, Sci. Pub'n back
Identify other regions: This species has invaded much of the Northern United States and Canada, as well as places in Europe.	
Rationale: This species has the potential to invade other wooded areas of Colorado.	
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. Henderson, D., and R. Chapman. 2006. <i>Caragana Arborescens</i> Invasion in Elk Island National Park, Canada. <i>Natural Areas Journal</i> . 26:261-266.	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: This plant has the ability to invade many types of forested areas.	
Rationale: This species prefers to grow in forested gaps (3). This could include many types of forest at a wide range of temperatures/elevations.	
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10. 3. Henderson, D., and R. Chapman. 2006. <i>Caragana Arborescens</i> Invasion in Elk Island National Park, Canada. <i>Natural Areas Journal</i> . 26:261-266.	

Question 3.2 Distribution/Peak frequency	D Other Pub. Mat'l back
Describe distribution: So far in Colorado, there has been no large infestations of this species.	
Rationale:	
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 4.1 Poisonous to Livestock	D Anecdotal back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: none noted	
Rationale:	
Sources of information:	
Question 4.2 Detrimental to Economic Crops	D Anecdotal back
Describe impacts to all aspects of cropping systems (see guidelines): This plant will likely not affect cropping systems.	
Rationale:	
Sources of information:	
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture	C Rev'd, Sci. Pub'n back
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: This plant can increase nitrogen level in the environment.	
Rationale: This plant could increase soil nitrogen in range/pasture lands increasing the abundance of undesirable species, such as downy brome. However, this species is not likely to grow in large enough numbers to affect large-scale populations in range areas.	
Sources of information: 1. Henderson, D., and R. Chapman. 2006. Caragana Arborescens Invasion in Elk Island National Park, Canada. Natural Areas Journal. 26:261-266. 2. Hensley, D. and P. Carpenter. 1979. The Effect of Temperature on N ₂ Nixation (C ₂ H ₂ Reduction) by Nodules of Legume and Actinomycete-Nodulated Woody Species. Botanical Gazette. 140:S58-S64.	

Question 4.4 Human Health Impacts	C Other Pub. Mat'l back
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: This plant can be used as a windbreak.	
Rationale: This plant can be used in colder regions as a windbreak due to its cold-hardiness.	
Sources of information: 1. Alaska Natural Heritage Program. 2006. Siberian Peashrub <i>Caragana Arborescens</i> Lam. Non-Native Plant Species of Alaska. 2. Dietz, D., P. Slabaugh, and F. Bonner. <i>Caragana Arborescens</i> Lam. Siberian Peashrub. FabaceaeCPea Family. 4.30-2010. http://www.nsl.fs.fed.us/wpsm/Caragana.pdf	

Worksheet A

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Reaches reproductive maturity in 2 years or less	No: 0 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	No: 0 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	Total Pts Total Unknowns
	B (4-5 pts)
Note any related traits: enter text here	

Worksheet B - Colorado Ecological Types and Land Use

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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	score
	Riparian shrublands	score
	Wet meadows	score
Grasslands	Shortgrass prairie	D. present
	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)	D. present
Developed Lands	Urban, exurban, industrial	D. present
Arid Shrublands	Sagebrush shrublands	D. present
	Foothills shrublands	score
	Gambel oak shrublands	score
Woodlands	Pinyon - juniper	score
	Ponderosa pine	D. present
	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).

Worksheet C – Human Impacts

Human health impacts; irritants (sap), spines, poisonous, and/or smoke impacts	No: 0 pt
Property values are decreased due to increased risk of fire	No: 0 pts
Decreased property value due to moderate to heavy infestations	No: 0 pts
Decreased land value for recreational use; boating, fishing, camping, etc.	No: 0 pts
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	Yes: 2 pt
	Total Pts Total Unknowns
	C (1-2)
Note any related traits: enter text here	