

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):	Epilobium hirsutum L.
Synonyms:	Epilobium hirsutum
Common names:	Hairy willow herb, Codlins and cream, Giant hairy willow herb
Evaluation date (mm/dd/yy):	3/2/10
Evaluator #1 Name/Title:	Ryan Edwards, Grad student
Affiliation:	Colorado State University
Phone numbers:	(720) 308-1569
Email address:	Redwards155@hotmail.com
Address:	300 w. pitkin ave., Ft. Collins, CO 80525
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
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:

Hairy willow herb is a semi-aquatic perennial herb, which appears to have a similar growth pattern to Purple loosestrife. The literature is very lacking in the basic biology of Hairy willow herb, however, it does appear that it and Purple loosestrife can coexist together. Hairy willow herb can form dense monotypic stands, similar to Purple loosestrife. Purple loosestrife infestations may facilitate Hairy willow herb invasions. If Purple loosestrife is eliminated, then it appears that Hairy willow herb infestations become limited. Therefore, known Colorado infestations should be monitored to assess invasability.

Hairy willow herb is described as being an aquatic herb, often covered in small hairs, giving it its name. Plants can grow upwards of six feet, and feature many erect branches. Similar in appearance to Fireweed, Hairy willow herb produces large, pink or purple flowers that have four notched petals. Flowers can develop long seed pods, which release windblown seeds late in the growing season. However, the major method of dispersal is through large mats of rhizomes. These mats of rhizomes form the dense stands of Hairy willow herb which can infest large areas, and push out many native riparian species, and influence hydrologic regimes.

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l	<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>BABD</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>Limited No Alert</p>
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		
2.1	Role of anthropogenic and natural disturbance	B (2 pts)	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>8</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>C</p>	
2.2	Local rate of spread with no management	B (2 pts)	Other Pub. Mat'l		
2.3	Recent trend in total area infested within state	D (0 pts)	No Information		
2.4	Innate reproductive potential Wksht A	C (1 pt)	Other Pub. Mat'l		
2.5	Potential for human-caused dispersal	D (0 pts)	No Information		
2.6	Potential for natural long-distance dispersal	C (1 pt)	Doc'n level		
2.7	Other regions invaded	B (2 pts)	Doc'n level		
3.1	Ecological amplitude/Range	U	No Information	<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>U</p>	
3.2	Distribution/Peak frequency Wrksht B	U	No Information		

<u>4.1</u>	Poisonous to livestock	D (0 pts)	No Information
<u>4.2</u>	Detrimental to economic crops	B (2 pts)	Other Pub. Mat'l
<u>4.3</u>	Detrimental to management of agricultural system, rangeland and pasture	B (2 pts)	Other Pub. Mat'l
<u>4.4</u>	Human impacts <u>Wrksht C</u>	B (2 pts)	Anecdotal

Agricultural / Human Impact

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

6

Use matrix to determine score and enter below:

B

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>B Other Pub. Mat'l back</p>
<p>Identify ecosystem processes impacted: Hairy willow herb has a similar effect on wetlands as Purple loos strife; Hairy willow herb can form dense monotypic stands, which can degrade riparian areas and influence hydrologic cycles (1,2).</p>	
<p>Rationale: Water usage appears to be the main impact of Hairy willow herb on riparian environments. The literature compares the ecological impacts of Hairy willow herb to that of Purple loosestrife, and indicates that the two of them share many of the same environments.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http:// www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p> <p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</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: Hairy willow herb can form dense monotypic stands when it becomes established (1,2).</p>	
<p>Rationale: These monotypic stands can crowd out other native plants, and degrade surrounding environments. Hairy willow herb can reproduce by rhizomes, which can further increase the spread of infestations.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http:// www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p> <p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>B Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Hairy willow herb can form dense stands in riparian environments, and can disrupt or displace many native species (1,2).</p>	
<p>Rationale: From the literature, there are no reports of any direct impacts from Hairy willow herb on the higher trophic levels, however the indirect effects of dense monotypic stands could influence higher trophic organisms by decreasing surrounding forage plants.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http:// www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p>	

<p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</p>	
<p>Question 1.4 Impact on genetic integrity</p>	<p>D No Information back</p>
<p>Identify impacts: There does not appear to be any instances in which Hairy willow herb has hybridized with any other <i>Epilobium</i> species.</p>	
<p>Rationale: The literature does not indicate that Hairy willow herb can cross with any other species. Hairy willow herb has been known to cross pollinate with other Hairy willow herbs, but there are no reports of hybrids between species.</p>	
<p>Sources of information: enter text here</p>	
<p>Question 2.1 Role of anthropogenic and natural disturbance in establishment</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe role of disturbance: Hairy willow herb has been known to establish in disturbed environments, such as moist pastures, ditches, stream banks and irrigation canals (1,2).</p>	
<p>Rationale: Similar to Purple loosestrife, Hairy willow herb can establish in environments that have become degraded or are frequented by human mediated disturbance.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http://www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p> <p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</p>	
<p>Question 2.2 Local rate of spread with no management</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe rate of spread: Hairy willow herb can quickly form dense monotypic stands, by sending out fast growing rhizomes (1). Much of Hairy willow herbs growth occurs late in the season; the literature states that commonly Hairy willow herb and Purple loosestrife are found together, and the primary production of Hairy willow herb occurs once Purple loosestrife has completed its lifecycle, generally in the autumn months (1).</p>	
<p>Rationale: Dense infestations of Hairy willow herb can dominate areas when they are not managed. When Hairy willow herb is found with Purple loosestrife, the potential for dominance over a site throughout the growing season is very prominent; Purple loosestrife typically grows in the early Spring, followed by Hairy willow herb in the Autumn.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http://www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p>	

Question 2.3 Recent trend in total area infested within state	D No Information back
Describe trend: There is no information in the literature indicating the Hairy willow herb has invaded Colorado.	
Rationale: The USDA PLANTS database indicates that Hairy willow herb has invaded Washington, Oregon, Wisconsin, Indiana, and much of the east coast (3).	
Sources of information: (3) USDA PLANTS database. <i>Epilobium hirsutum</i> L. (codlins and cream). Available at: http://plants.usda.gov/java/profile?symbol=EPHI	
Question 2.4 Innate reproductive potential	C Other Pub. Mat'l back
Describe key reproductive characteristics: Primary reproduction is by underground rhizomes (2). Hairy Willow herb can also reproduce from seed, and can be either cross or self pollinated. However, it has been observed that when Hairy willow herb self pollinates, overall seed production is lowered (1).	
Rationale: While rhizomes appear to be a significant enough reproductive source, seed production is also very common. However, when plants self, they have decreased fitness, indicating that the plants are more cross pollinated than self pollinated. Therefore, there must be a significant enough existing population of plants to create crossing, otherwise plants will self and produce less fit seeds and invasiveness would be decreased.	
Sources of information: (1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http:// www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html (2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf	
Question 2.5 Potential for human-caused dispersal	D No Information back
Identify dispersal mechanisms: There were no instances in the literature where hairy willow herb was dispersed by humans.	
Rationale: The literature did not list any instances in which human activity could have dispersed Hairy willow herb. There are no unique structures on the seeds with can cling to human clothing or machinery. Potential transport of the rhizomes did not turn up any instances in which rhizomes had been spread to new sites and established.	
Sources of information: enter text here	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
Identify dispersal mechanisms: Hairy willow herb can be dispersed by windblown seeds (2).	

<p>Rationale: The distance these windblown seeds can travel was not found in the literature; however it does not appear to be very far. The main dispersal pathway that Hairy willow herb has been observed to follow is spread by rhizomes, which can form dense monotypic stands.</p>	
<p>Sources of information:</p> <p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</p>	
<p>Question 2.7 Other regions invaded</p>	<p>B Other Pub. Mat'l back</p>
<p>Identify other regions: Hairy willow herb has been known to invade multiple riparian and aquatic habitats (1,2).</p>	
<p>Rationale: Here in Colorado, establishment of Hairy willow herb could occur in our many riparian corridors, and along stream banks, irrigation canals, and other similar environments that Purple loosestrife can establish.</p>	
<p>Sources of information:</p> <p>(1) Hamel, K. Non-native invasive freshwater plants: Hairy willow herb. Washington State Department of Ecology fact sheet. Available at http://www.ecy.wa.gov/programs/wq/plants/weeds/willowherb.html</p> <p>(2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willowherb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf</p>	
<p>Question 3.1 Ecological amplitude/Range</p>	<p>U Doc'n level back</p>
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: The literature does not describe any instances in which Hairy willow herb has invaded Colorado. There was no information available to assess the overall ecological amplitude that Hairy willow herb could inhabit.</p>	
<p>Rationale: The USDA PLANTS database indicates that Hairy willow herb has invaded Washington, Oregon, Wisconsin, Indiana, and much of the east coast (3).</p>	
<p>Sources of information:</p> <p>(3) USDA PLANTS database. <i>Epilobium hirsutum</i> L. (codlins and cream). Available at: http://plants.usda.gov/java/profile?symbol=EPHI</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>U Doc'n level back</p>
<p>Describe distribution: The literature does not describe any instances in which Hairy willow herb has invaded Colorado.</p>	
<p>Rationale: The USDA PLANTS database indicates that Hairy willow herb has invaded Washington, Oregon,</p>	

Wisconsin, Indiana, and much of the east coast (3).	
Sources of information: (3) USDA PLANTS database. <i>Epilobium hirsutum</i> L. (codlins and cream). Available at: http://plants.usda.gov/java/profile?symbol=EPHI	
Question 4.1 Poisonous to Livestock	D No Information back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: There does not appear to be any instances in the literature where Hairy willow herb has caused a poisoning in animals.	
Rationale: The literature does not cite any instances where livestock or wildlife have been poisoned by feeding upon Hairy willow herb.	
Sources of information: enter text here	
Question 4.2 Detrimental to Economic Crops	B Other Pub. Mat'l back
Describe impacts to all aspects of cropping systems (see guidelines): Hairy willow herb has been known to influence hydrological regimes, and impede water flow (2).	
Rationale: In Colorado, with our already limited water resources, any further species which could potentially influence our delicate water supply must be paid attention to very closely.	
Sources of information: (2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willow herb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf	
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture	B Other Pub. Mat'l back
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: Hairy willow herb has been known to invade pastures and rangelands, when water permits (2). Hairy willow herb has also been linked to changes in the hydrological regime of waterways and can impede water flow (2).	
Rationale: Establishment of Hairy willow herb into rangelands and pastures depends upon the soil moisture characteristics or the presence of open bodies of water. Establishment could mirror that of Purple loosestrife, which can be found in and around open bodies of water, and along irrigation canals where it can impede water flow.	
Sources of information: (2) King County Department of natural resources and parks: noxious weed control program. 2008. Hairy willow herb. Available at: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Hairy-Willowherb-Fact-Sheet.pdf	

Willowherb-Fact-Sheet.pdf	
Question 4.4 Human Health Impacts	B Anecdotal back
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: Hairy willow herb can establish along water ways and could impeded agriculture or recreation.	
Rationale: Similar to Purple loosestrife, Hairy willow herb could block access to Colorado’s streams and waterways, and could influence irrigation thus effecting agriculture.	
Sources of information: enter text here	

Worksheet A

[back](#)

Reaches reproductive maturity in 2 years or less	No: 0 pt
Dense infestations produce >1,000 viable seed per square meter	Unknown: 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	Unknown: 0 pts
Seeds remain viable in soil for three or more years	Unknown: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes: 1 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	Unknown: 0 pts
Resprouts readily when cut, grazed, or burned	Unknown: 0 pts
	3 pts 5 unknowns
	C (1-3)
Note any related traits: The literature is lacking much of the information on the reproductive abilities of Hairy willow herb. However, it was apparent that Hairy willow herb does reproduce through rhizomes, is both self and cross pollinated, and produces seed every year.	

Worksheet B - Colorado Ecological Types and Land Use

[back](#)

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

* 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.	Yes: 1 pt
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	Yes: 2 pt
	3 pts Total Unknowns
	B (3 pts)
Note any related traits: Hairy willow herb exhibits a similar growth pattern to Purple Loosestrife; plants seem to invade moist areas such as lake shores, canal borders, or moist fields/ pastures. These infestations can form dense stands and can impeded access to the bodies of water, influencing recreation and agriculture.	