ALASKA NON-NATIVE PLANT INVASIVENESS RANKING FORM

Botanical name: *Deschampsia elongata* (Hook.) Munro
Common name: slender hairgrass
Assessors:

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Date: 1/17/2011
Date of previous ranking, if any: 5T

OUTCOME SCORE:

CLIMATIC COMPARISON

This species is present or may potentially establish in the following eco-geographic regions:

Pacific Maritime	Yes
Interior-Boreal	Yes
Arctic-Alpine	Yes

INVASIVENESS RANKING	**Total** (total answered points possible[1])	**Total**
Ecological impact	40 (40)	12
Biological characteristics and dispersal ability	25 (25)	13
Ecological amplitude and distribution	25 (19)	4
Feasibility of control	10 (7)	3
Outcome score	100 (91)[b]	32[a]
Relative maximum score[2]		**35**

[1] For questions answered "unknown" do not include point value for the question in parentheses for "total answered points possible."
[2] Calculated as a/b × 100

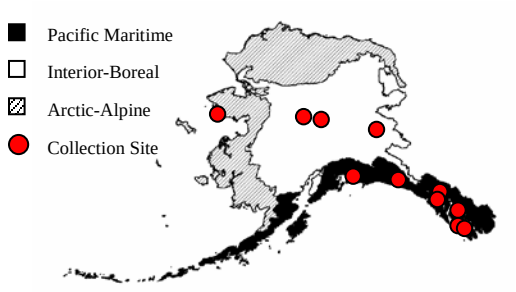
A. CLIMATIC COMPARISON

1.1. Has this species ever been collected or documented in Alaska?

☒ Yes - continue to 1.2
☐ No - continue to 2.1

1.2. From which eco-geographic region has it been collected or documented (see inset map)? Proceed to Section B. INVASIVNESS RANKING

☒ Pacific Maritime
☒ Interior-Boreal
☒ Arctic-Alpine



Documentation: *Deschampsia elongata* has been documented from all three ecogeographic regions of Alaska (Hultén 1968, AKEPIC 2010, UAM 2010).

2.1. Is there a 40 percent or higher similarity (based on CLIMEX climate matching, see references) between climates where this species currently occurs and:

a. Juneau (Pacific Maritime region)?
☐ Yes – record locations and percent similarity; proceed to Section B.
☐ No

b. Fairbanks (Interior-Boreal region)?
☐ Yes – record locations and percent similarity; proceed to Section B.
☐ No

c. Nome (Arctic-Alpine region)?
☐ Yes – record locations and percent similarity; proceed to Section B.
☐ No

If "No" is answered for all regions; reject species from consideration

Documentation:

B. INVASIVENESS RANKING

1. Ecological Impact

1.1. Impact on Natural Ecosystem Processes

a.	No perceivable impact on ecosystem processes	0
b.	Has the potential to influence ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability)	3
c.	Has the potential to cause significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, degrades habitat important to waterfowl)	7
d.	Has the potential to cause major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology, hydrology, or affects fire frequency thereby altering community composition; species fixes substantial levels of nitrogen in the soil making soil unlikely to support certain native plants or more likely to favor non-native species)	10
e.	Unknown	U

Score **3**

Documentation: *Deschampsia elongata* often establishes in secondary successional environments and on disturbed, moist ground, but populations are short-lived. This species likely has relatively minor impacts to soil moisture and nutrients and minor impacts on successional processes as it is a species primarily restricted to low competition, disturbed substrates (Darris and Tracey 2006).

1.2. Impact on Natural Community Structure

a.	No perceived impact; establishes in an existing layer without influencing its structure	0
b.	Has the potential to influence structure in one layer (e.g., changes the density of one layer)	3
c.	Has the potential to cause significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer)	7
d.	Likely to cause major alteration of structure (e.g., covers canopy, eliminating most or all lower layers)	10
e.	Unknown	U

Score **3**

Documentation: *Deschampsia elongata* forms dense tufts (Esser 1994, Barkworth 2007) and may increase the density of graminoid layers in moist, disturbed areas.

1.3. Impact on Natural Community Composition

a.	No perceived impact; causes no apparent change in native populations	0
b.	Has the potential to influence community composition (e.g., reduces the population size of one or more native species in the community)	3
c.	Has the potential to significantly alter community composition (e.g., significantly reduces the population size of one or more native species in the community)	7
d.	Likely to cause major alteration in community composition (e.g., results in the extirpation of one or more native species, thereby reducing local biodiversity and/or shifting the community composition towards exotic species)	10
e.	Unknown	U

Score **3**

Documentation: Dense tufts of *Deschampsia elongata* may reduce the sizes of native plant populations in moist, disturbed sites. However, this species does not grow extensively enough to significantly displace surrounding vegetation; 90% of infestations recorded in Alaska had 1% cover (AKEPIC 2011).

1.4. Impact on associated trophic levels (cumulative impact of this species on the animals, fungi, microbes, and other organisms in the community it invades)

a.	Negligible perceived impact	0
b.	Has the potential to cause minor alteration (e.g., causes a minor reduction in nesting or foraging sites)	3
c.	Has the potential to cause moderate alteration (e.g., causes a moderate reduction in habitat connectivity, interferes with native pollinators, or introduces injurious components such as spines, toxins)	7

d.	Likely to cause severe alteration of associated trophic populations (e.g., extirpation or endangerment of an existing native species or population, or significant reduction in nesting or foraging sites)	10
e.	Unknown	U

Score **3**

Documentation: Prior to maturity, *Deschampsia elongata* provides good forage for grazing animals. It provides habitat for waterfowl, shorebirds, and other wildlife (Darris and Tracey 2006). The impacts of *Deschampsia elongata* on associated trophic levels are largely undocumented.

Total Possible 40
Total **12**

2. Biological Characteristics and Dispersal Ability

2.1. Mode of reproduction

a.	Not aggressive (produces few seeds per plant [0-10/m^2] and not able to reproduce vegetatively).	0
b.	Somewhat aggressive (reproduces by seed only [11-1,000/m^2])	1
c.	Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed [<1,000/m^2])	2
d.	Highly aggressive (extensive vegetative spread and/or many seeded [>1,000/m^2])	3
e.	Unknown	U

Score **2**

Documentation: *Deschampsia elongata* reproduces sexually by seeds and vegetatively by tillering (Esser 1994). The number of seeds produced per plant has not been quantified, but is expected to be capable of producing hundreds of seeds per plant based on floret numbers (Carlson pers. obs.).

2.2. Innate potential for long-distance dispersal (wind-, water- or animal-dispersal)

a.	Does not occur (no long-distance dispersal mechanisms)	0
b.	Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations)	2
c.	Numerous opportunities for long-distance dispersal (species has adaptations such as pappus, hooked fruit coats, etc.)	3
d.	Unknown	U

Score **2**

Documentation: Because seeds are very small and have a mass of roughly 0.2 mg each (Darris and Tracey 2006), they are likely transported short distances by wind.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sale of species, use as forage or for revegetation, dispersal along highways, transport on boats, common contaminant of landscape materials, etc.).

a.	Does not occur	0
b.	Low (human dispersal is infrequent or inefficient)	1

c.	Moderate (human dispersal occurs regularly)	2
d.	High (there are numerous opportunities for dispersal to new areas)	3
e.	Unknown	U
	Score	**2**

Documentation: All infestations in Alaska occur in areas of high human traffic. *Deschampsia elongata* is most common along roads, especially in southeast Alaska (AKEPIC 2011), suggesting that seeds are a possible contaminant in revegetation seed mixes imported from the Pacific Northwest (Graziano pers. obs.).

2.4. Allelopathic

a.	No	0
b.	Yes	2
c.	Unknown	U
	Score	**0**

Documentation: No evidence suggests that *Deschampsia elongata* is allelopathic.

2.5. Competitive ability

a.	Poor competitor for limiting factors	0
b.	Moderately competitive for limiting factors	1
c.	Highly competitive for limiting factors and/or able to fix nitrogen	3
d.	Unknown	U
	Score	**1**

Documentation: Populations are often short-lived. *Deschampsia elongata* is not likely to compete strongly with weedy, herbaceous species, but it spreads readily on moist, disturbed ground (Darris and Tracey 2006).

2.6. Forms dense thickets, has a climbing or smothering growth habit, or is otherwise taller than the surrounding vegetation.

a.	Does not grow densely or above surrounding vegetation	0
b.	Forms dense thickets	1
c.	Has a climbing or smothering growth habit, or is otherwise taller than the surrounding vegetation	2
d.	Unknown	U
	Score	**0**

Documentation: *Deschampsia elongata* forms dense tufts, but does not form extensive monocultures or overtop surrounding species (Barkworth 2007).

2.7. Germination requirements

a.	Requires sparsely vegetated soil and disturbance to germinate	0
b.	Can germinate in vegetated areas, but in a narrow range of or in special conditions	2
c.	Can germinate in existing vegetation in a wide range of conditions	3
d.	Unknown	U
	Score	**0**

Documentation: In Alaska and Yukon, *Deschampsia elongata* grows in moist areas in inhabited places, disturbed sites, roadsides, mined areas, and logged areas (Hultén 1968, Cody 1996, AKEPIC 2011).

2.8. Other species in the genus invasive in Alaska or elsewhere

a.	No	0
b.	Yes	3
c.	Unknown	U
	Score	**3**

Documentation: *Deschampsia danthonioides* is native to the western U.S. (Barkworth 2007). Populations were introduced to Yukon in the late 19th and early 20th centuries but have not persisted (Cody 1996). Introduced populations were recorded in Alaska in 1968, but they also do not appear to have persisted (Hultén 1968, AKEPIC 2011, UAM 2011). *Deschampsia cespitosa* is known to occur as a non-native species in Svalbard, where it is potentially invasive (NOBANIS 2011).

2.9. Aquatic, wetland, or riparian species

a.	Not invasive in wetland communities	0
b.	Invasive in riparian communities	1
c.	Invasive in wetland communities	3
d.	Unknown	U
	Score	**3**

Documentation: *Deschampsia elongata* grows in wetlands and riparian communities in its native range (Esser 1994, USDA 1997, Klinkenberg 2010), suggesting that it has the potential to invade wetland and riparian communities in Alaska.

Total Possible	25
Total	**13**

3. Ecological Amplitude and Distribution

3.1. Is the species highly domesticated or a weed of agriculture?

a.	Is not associated with agriculture	0
b.	Is occasionally an agricultural pest	2
c.	Has been grown deliberately, bred, or is known as a significant agricultural pest	4
d.	Unknown	U
	Score	**2**

Documentation: *Deschampsia elongata* is sown for erosion control and revegetation in areas where it is native, and seeds are available commercially in California and Oregon (Darris and Tracey 2006). While this species is grown deliberately, it is only grown in its native range (Barkworth et al. 2007). Seeds are a potential contaminant in revegetation seed mixes imported from the Pacific Northwest (Graziano pers. obs.).

3.2. Known level of ecological impact in natural areas

a.	Not known to impact other natural areas	0
b.	Known to impact other natural areas, but in habitats and climate zones dissimilar to those in Alaska	1

c.	Known to cause low impact in natural areas in habitats and climate zones similar to those in Alaska	3
d.	Known to cause moderate impact in natural areas in habitat and climate zones similar to those in Alaska	4
e.	Known to cause high impact in natural areas in habitat and climate zones similar to those in Alaska	6
f.	Unknown	U
	Score	**U**

Documentation: *Deschampsia elongata* has been introduced to Yukon and Nunavut, but no ecological impacts have been documented (Cody 1996, Cody et al. 2003).

3.3. Role of anthropogenic and natural disturbance in establishment

a.	Requires anthropogenic disturbance to establish	0
b.	May occasionally establish in undisturbed areas, readily establishes in naturally disturbed areas	3
c.	Can establish independently of natural or anthropogenic disturbances	5
e.	Unknown	U
	Score	**0**

Documentation: *Deschampsia elongata* establishes in moist, disturbed areas (Hultén 1968, Cody 1996), but has not been documented establishing in naturally disturbed or vegetated areas in Alaska (AKEPIC 2011).

3.4. Current global distribution

a.	Occurs in one or two continents or regions (e.g., Mediterranean region)	0
b.	Extends over three or more continents	3
c.	Extends over three or more continents, including successful introductions in arctic or subarctic regions	5
e.	Unknown	U
	Score	**0**

Documentation: *Deschampsia elongata* is native to western North America and Chile (Barkworth 2007) but is considered introduced in Alaska, Colorado, Maine, Nunavut, and Yukon (Hultén 1968, Cody 1996, Cody et al. 2003, Barkworth 2007).

3.5. Extent of the species' U.S. range and/or occurrence of formal state or provincial listing

a.	Occurs in 0-5 percent of the states	0
b.	Occurs in 6-20 percent of the states	2
c.	Occurs in 21-50 percent of the states and/or listed as a problem weed (e.g., "Noxious," or "Invasive") in one state or Canadian province	4
d.	Occurs in more than 50 percent of the states and/or listed as a problem weed in two or more states or Canadian provinces	5
e.	Unknown	U
	Score	**2**

Documentation: *Deschampsia elongata* grows in 14 states of the U.S. and western Canada (USDA 2011); however, it is only considered non-native in Alaska, Colorado, Maine, Nunavut,

and Yukon (Hultén 1968, Cody 1996, Cody et al. 2003, Barkworth 2007). It is not considered a noxious weed in any states of the U.S. or provinces of Canada.

Total Possible	19
Total	**4**

4. Feasibility of Control

4.1. Seed banks

a.	Seeds remain viable in the soil for less than three years	0
b.	Seeds remain viable in the soil for three to five years	2
c.	Seeds remain viable in the soil for five years or longer	3
e.	Unknown	U

Score **U**

Documentation: The amount of time seeds remain viable in the soil is unknown.

4.2. Vegetative regeneration

a.	No resprouting following removal of aboveground growth	0
b.	Resprouting from ground-level meristems	1
c.	Resprouting from extensive underground system	2
d.	Any plant part is a viable propagule	3
e.	Unknown	U

Score **1**

Documentation: As a grass, vegetative regeneration in *Deschampsia elongata* is expected to occur from ground-level meristems.

4.3. Level of effort required

a.	Management is not required (e.g., species does not persist in the absence of repeated anthropogenic disturbance)	0
b.	Management is relatively easy and inexpensive; requires a minor investment of human and financial resources	2
c.	Management requires a major short-term or moderate long-term investment of human and financial resources	3
d.	Management requires a major, long-term investment of human and financial resources	4
e.	Unknown	U

Score **2**

Documentation: In British Columbia, *Deschampsia elongata* seeded on previously disturbed sites in a mixture of native grasses did not persist after one to several years of growth (Vaartnou 2004). Populations of *Deschampsia elongata* established in burned areas in Montana during the 7th postfire year but only persisted for one or two years (Esser 2004). It is possible that some populations will naturally decline after several years of growth. While control measures have not been investigated, it is likely that pulling, digging, or cutting infestations for several growing seasons will effectively control this species, as grazed populations do not persist unless grazing is deferred every other year during flowering and seed set (Darris and Tracey 2006).

Total Possible	7

Total	**3**

Total for four sections possible	91
Total for four sections	**32**

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