ALASKA NON-NATIVE PLANT INVASIVENESS RANKING FORM

Botanical name: *Alopecurus pratensis* L.
Common name: meadow foxtail
Assessors:

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Date: 10/18/2010
Date of previous ranking, if any: 6T

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)	10
Biological characteristics and dispersal ability	25 (25)	16

Ecological amplitude and distribution	25 (25)	20
Feasibility of control	10 (7)	4
Outcome score	100 (97)[b]	50[a]
Relative maximum score[2]		**52**

[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

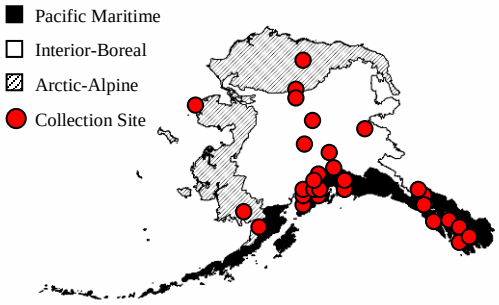
1.1. Has this species ever been collected or documented in Alaska?

☒ 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: *Alopecurus pratensis* 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: *Alopecurus pratensis* probably has little impact on ecosystem processes (Rutledge and McLendon 1996). It may, however, outcompete native species for nitrogen in the soil (Venterink and Güsewell 2010).

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	**1**

Documentation: *Alopecurus pratensis* may increase the density of graminoid layers in disturbed sites in Alaska (AKEPIC 2010). Although this species invades emergent wetlands, meadows, and marshy areas, no evidence has been documented of it changing the density of vegetation in these habitats (OSU Rangeland Ecology and Management 2005, DiTomaso and Healy 2007).

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: In its native range, *Alopecurus pratensis* can develop pure stands on nutrient-rich, wet soils (Peeters 2004). This species has been observed spreading to the detriment of native plants in large montane meadow complexes and wet areas in northwestern North America (OSU Rangeland Ecology and Management 2005, Neugarten and Elseroad 2006, DiTomaso and Healy 2007). In disturbed areas and wet, nutrient-rich meadows, *Alopecurus pratensis* has the potential to reduce the population sizes of native plants (Crawley et al. 1999).

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: *Alopecurus pratensis* is palatable to wildlife, although its nutritional value and digestibility vary with the age of the grass and the region in which it grows. This species provides cover for small animals (Peeters 2004, OSU Rangeland Ecology and Management 2005). Several fungi and nematode species have been associated with *Alopecurus pratensis* (Duke 1983, Peeters 2004).

Total Possible	40
Total	**10**

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: *Alopecurus pratensis* reproduces sexually by seeds and vegetatively by sprouting from short rhizomes and rooting at lower stem nodes. Plants are prolific seed producers, but the amount of seeds produced per plant has not been quantified (Rutledge and McLendon 1996, OSU Rangeland Ecology and Management 2005, DiTomaso and Healy 2007, Klinkenberg 2010, USDA 2010).

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: Seeds are light and can be dispersed by wind. They are occasionally transported by the movement of water, but they do not appear to be specifically adapted for water dispersal (Rosenthal 2006, USDA 2010).

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: In Alaska, *Alopecurus pratensis* is used as a forage crop (Quarberg and Jahns 2002), and it has been associated with grass seed and imported straw, which is sometimes used by mushers as dog-bedding (Conn 2010, Conn et al. 2006). This species is commonly planted as a garden ornamental and as a forage crop (DiTomaso and Healy 2007).

2.4. Allelopathic

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

Score **0**

Documentation: No evidence suggests that *Alopecurus pratensis* 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: *Alopecurus pratensis* is highly competitive when growing in nutrient-rich, wet meadows. In its native range, *Alopecurus pratensis* often dominates other grassland species under favorable conditions (Peeters 2004). Nearly 40% of experimental plots sown with seed mixes of 80 dicot species became dominated by *Alopecurus pratensis* after seven years. *Alopecurus pratensis* outcompeted *Arrhenatherum elatius*, *Festuca rubra*, and *Anthoxanthum odoratum* when sown on experimental plots with those grasses (Crawley et al. 1999). In Alaska, however, *Alopecurus pratensis* does not appear to outcompete native species (DeVelice pers. obs., Rapp pers. obs.).

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	**1**

Documentation: *Alopecurus pratensis* sometimes forms thick mats and dense sods (Rutledge and McLendon 1996, Dzyubenko and Dzyubenko 2009).

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	**2**

Documentation: *Alopecurus pratensis* is a facultative wetland species that can establish in disturbed areas and can invade moist places, marshy areas, wet meadows, emergent wetlands, and coastal slopes (OSU Rangeland Ecology and Management 2005, Neugarten and Elseroad 2006, DiTomaso and Healy 2007). Seeds can germinate in vegetated areas that have deep soil and receive little shade (MacDougall et al. 2006).

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

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

Documentation: *Alopecurus geniculatus* is known to occur as a non-native species in Alaska and has an invasiveness rank of 49 (AKEPIC 2010). *A. myosuroides* is listed as a noxious weed in Washington (USDA 2010).

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: *Alopecurus pratensis* grows well in seasonal wetlands, moist places, and damp meadows. It has invaded emergent wetlands, moist meadows, ditches, and stream banks in Oregon and California (OSU Rangeland Ecology and Management 2005, Neugarten and Elseroad 2006, DiTomaso and Healy 2007).

Total Possible	25
Total	**16**

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 **4**

Documentation: *Alopecurus pratensis* is cultivated as a pasture grass in many parts of the world, including the Pacific Northwest, Southern Canada, and Alaska. It is also planted as a garden ornamental (Duke 1983, Morisawa 1999, Quarberg and Jahns 2002, DiTomaso and Healy 2007).

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 **3**

Documentation: *Alopecurus pratensis* invades emergent wetlands, moist meadows, ditches, streams, and grasslands in Oregon. It is spreading in wet and dry meadows to the detriment of native plants in Sycan Marsh, a large montane meadow complex (OSU Rangeland Ecology and Management, Neugarten and Elseroad 2006).

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 **3**

Documentation: *Alopecurus pratensis* establishes primarily in disturbed areas or around abandoned cabin sites in Alaska; however, it has been documented establishing in wet and dry meadows that are dominated by native vegetation in Oregon (Neugarten and Elseroad 2006, AKEPIC 2010).

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 **5**

Documentation: *Alopecurus pratensis* is native to Eurasia. It has been introduced to Japan, North America, and Australia (Duke 1983, Western Australian Herbarium 1998, eFloras 2008). This species has been collected from arctic Norway and Svalbard, at approximately 78°N (Vascular Plant Herbarium Oslo 2010).

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 **5**

Documentation: *Alopecurus pratensis* grows in 41 states of the U.S. (USDA 2010).

Total Possible 25
Total **20**

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: Seed banks are persistent for a short term or are transient. The exact amount of time seeds remain viable under field conditions has not been documented (Rosenthal 2006, USDA 2010).

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: *Alopecurus pratensis* can resprout from its short, non-aggressive rhizomes following disturbances (OSU Rangeland Ecology and Management 2005).

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 **3**

Documentation: Glyphosate herbicides applied at 1 kg per hectare in late summer can effectively control *Alopecurus pratensis* (OSU Rangeland Ecology and Management 2005). Frequent mowing and cutting can reduce plant yield and prevent seeding (OSU Rangeland Ecology and Management 2005). Digging and hand pulling methods have not been investigated but may be effective because the rhizomes are not extensive (Morisawa 1999).

Total Possible	7
Total	**4**

Total for four sections possible	97
Total for four sections	**50**

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