

WEED RISK ASSESSMENT FORM

Botanical name:	<i>Poa compressa</i> L.		
Common name:	Canada bluegrass		
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Outcome score:

A. Climatic Comparison		
This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes
2	Interior-Boreal	Yes
3	Arctic-Alpine	Yes

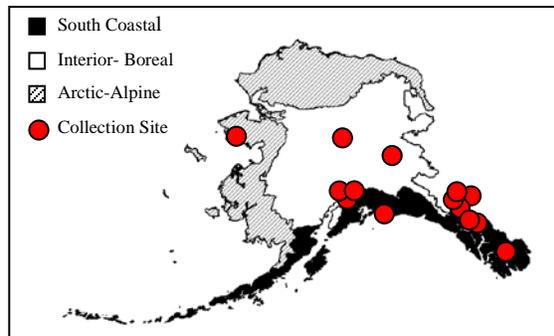
B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	6
2	Biological characteristic and dispersal ability	25 (25)	10
3	Ecological amplitude and distribution	25 (25)	17
4	Feasibility of control	10 (7)	5
	Outcome score	100 (97) ^b	38 ^a
	Relative maximum score†		0.39

* For questions answered "unknown" do not include point value for the question in parentheses for "Total Answered Points Possible."

† Calculated as ^a/_b.

A. CLIMATIC COMPARISON:

	1.1. Has this species ever been collected or documented in Alaska?
Yes	Yes – continue to 1.2
	No – continue to 2.1
	1.2. Which eco-geographic region has it been collected or documented (see inset map)? <i>Proceed to Section B. Invasiveness Ranking.</i>
Yes	South Coastal
Yes	Interior-Boreal
Yes	Arctic-Alpine



Documentation: *Poa compressa* has been documented in all ecogeographic regions in Alaska (Weeds of Alaska Database 2005, Hultén 1968, UAM 2004).

Sources of information:

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

University of Alaska Museum. University of Alaska Fairbanks. 2004.

<http://hispidamuseum.uaf.edu:8080/home.cfm>

Weeds of Alaska Database. 2005. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database. Available: <http://akweeds.uaa.alaska.edu/>

2.1. Is there a 40% or higher similarity (based on CLIMEX climate matching) between climates any where the species currently occurs and

a. Juneau (South Coastal Region)?

Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking

No

b. Fairbanks (Interior-Boreal)?

Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking

No

c. Nome (Arctic-Alpine)?

Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking

No

– If “No” is answered for all regions, reject species from consideration

Documentation:

Sources of information:

B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes

- | | | |
|----|---|----|
| A. | No perceivable impact on ecosystem processes | 0 |
| B. | Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) | 3 |
| C. | Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl) | 7 |
| D. | Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology; hydrology; or affects fire frequency, 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 |
| U. | Unknown | |

Score

1

Documentation:

Identify ecosystem processes impacted:

Canada bluegrass is generally restricted to non-native communities and likely has little impact on native plant communities and ecological processes (I. Lapina – pers. obs., Rutledge and McLendon 1996).

Rational:

Sources of information:

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife

1.2. Impact on Natural Community Structure

- A. No perceived impact; establishes in an existing layer without influencing its structure 0
- B. Influences structure in one layer (e.g., changes the density of one layer) 3
- C. Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) 7
- D. Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) 10
- U. Unknown

Score

Documentation:

Identify type of impact or alteration:

Canada bluegrass occurs in sparse stands and likely does not alter the density of the layer (I. Lapina – pers. obs., Sather 1996).

Rational:

Sources of information:

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

Sather, N. 1996. Element Stewardship Abstract for *Poa pratensis*, *Poa compressa* Kentucky Bluegrass, Canada Bluegrass. The Nature Conservancy. Arlington, VA.

1.3. Impact on Natural Community Composition

- A. No perceived impact; causes no apparent change in native populations 0
- B. Influences community composition (e.g., reduces the number of individuals in one or more native species in the community) 3
- C. Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community) 7
- D. Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or change the community composition towards species exotic to the natural community) 10
- U. Unknown

Score

Documentation:

Identify type of impact or alteration:

In Alaska, Canada bluegrass is restricted to non-native communities and it does not seem to be changing species composition (I. Lapina – pers. obs.).

Rational:

Sources of information:

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

1.4. Impact on higher 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. Minor alteration 3
- C. Moderate alteration (minor reduction in nesting/foraging sites, reduction in habitat connectivity, interference with native pollinators, injurious components such as spines, toxins) 7
- D. Severe alteration of higher trophic populations (extirpation or endangerment of an existing native species/population, or significant reduction in nesting or foraging sites) 10
- U. Unknown

Score

Documentation:

Identify type of impact or alteration:

Canada bluegrass is grazed by livestock and wildlife species (Gubanov et al. 2003, Dore and McNeill 1980). Canada bluegrass hybridizes with Kentucky bluegrass (Dale et al. 1975).

Rational:

Sources of information:

Dale, M.R., M.K. Ahmed, G. Jelenkovic and C.R. Funk. 1975. Characteristics and performance of interspecific hybrids between Kentucky bluegrass and Canada bluegrass. *Crop Science*; 15: 797-799.

Dore, W.G. and J. McNeill. 1980. *Grasses of Ontario*. Monograph 26. Ottawa, Ontario: Biosystematics Research Institute, Research Branch Agriculture Canada.

Gubanov, I.A., K.V. Kiseleva, V.S. Novikov and V.N. Tihomirov. An illustrated identification book of the plants of Middle Russia, Vol. 1: Vascular cryptograms, gymnosperms, angiosperms (monocots). Moscow: Institute of Technological Researches; 2003. 526 p. In Russian.

Total Possible

40

Total

6

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode of reproduction

- A. Not aggressive reproduction (few [0-10] seeds per plant and no vegetative reproduction) 0
- B. Somewhat aggressive (reproduces only by seeds (11-1,000/m²)) 1
- C. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m²) 2
- D. Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m²) 3
- U. Unknown

Score

2

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Canada bluegrass reproduces by both seeds and rhizomes (Rutledge and McLendon 1973). In Alaska, it does not seem to be reproducing aggressively.

Rational:

Sources of information:

Rutledge, C.R. and T. McLendon. 1996. *An Assessment of Exotic Plant Species of Rocky Mountain National Park*. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page.

<http://www.npwrc.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

2.2. Innate potential for long-distance dispersal (bird dispersal, sticks to animal hair, buoyant fruits, wind-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
- U. Unknown

Score

2

Documentation:

Identify dispersal mechanisms:

Cattle and deer seem to carry the seeds widely (Dore and McNeill 1980). However, the grass does not have any specific adaptations for long-distance dispersal.

Rational:

Sources of information:

Dore, W.G. and J. McNeill. 1980. Grasses of Ontario. Monograph 26. Ottawa, Ontario: Biosystematics Research Institute, Research Branch Agriculture Canada.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sales, use as forage/revegetation, spread along highways, transport on boats, contamination, etc.)

- A. Does not occur 0
- B. Low (human dispersal is infrequent or inefficient) 1
- C. Moderate (human dispersal occurs) 2
- D. High (there are numerous opportunities for dispersal to new areas) 3
- U. Unknown

Score 3

Documentation:

Identify dispersal mechanisms:

Canada bluegrass is used as a pasture grass and for erosion control (Rutledge and McLendon 1996, Hitchcock and Cronquist 1973). This plant is also a common seed contaminant (USDA, ARS 2005).

Rational:

Sources of information:

Hitchcock, C. L. and A. Cronquist. 1973. Flora of the Pacific Northwest: An Illustrated Manual. University of Washington Press, Seattle. 730 pp.

Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page.

<http://www.npwrc.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?300618> [October 5, 2005].

2.4. Allelopathic

- A. No 0
- B. Yes 2
- U. Unknown

Score 0

Documentation:

Describe effect on adjacent plants:

This species is not listed as allelopathic (USDA 2002).

Rational:

Sources of information:

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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 nitrogen fixing ability 3
- U. Unknown

Score 0

Documentation:

Evidence of competitive ability:

Canada bluegrass appears to be a poor competitor with other exotic plants (Turkington

1994).
Rational:
 In experiments of Turkington (1994) Canada bluegrass was the poorest invader and it was less resistant to invasion by other species. Invasive potential and resistance to invasion by other species decrease with the age of the Canada bluegrass stand. Canada bluegrass is also less adapted to grazing pressures (Sather 1996, Turkington 1994).
Sources of information:
 Sather, N. 1996. Element Stewardship Abstract for *Poa pratensis*, *Poa compressa* Kentucky Bluegrass, Canada Bluegrass. The Nature Conservancy. Arlington, VA.
 Turkington, R. 1994. Effect of propagule source on competitive ability of pasture grasses: spatial dynamics of six grasses in simulated swards. *Canadian Journal of Botany*; 72: 111-121.

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

- A. No 0
- B. Forms dense thickets 1
- C. Has climbing or smothering growth habit, or otherwise taller than the surrounding vegetation 2
- U. Unknown

Score 0

Documentation:
 Describe grow form:
 Canada bluegrass does not form dense stands, and it does not possess climbing or smothering growth habit (Welsh 1974, Hultén 1968).
Rational:

Sources of information:
 Hultén, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA. 1008 p.
 Welsh, S.L. 1974. *Anderson's flora of Alaska and adjacent parts of Canada*. Brigham University Press. 724 pp.

2.7. Germination requirements

- A. Requires open soil and disturbance to germinate 0
- B. Can germinate in vegetated areas but in a narrow range or in special conditions 2
- C. Can germinate in existing vegetation in a wide range of conditions 3
- U. Unknown

Score 0

Documentation:
 Describe germination requirements:
 Canada bluegrass germinates better on bare soil (Turkington 1994). It does not appear capable to germinating in areas where plants are already established.
Rational:

Sources of information:
 Turkington, R. 1994. Effect of propagule source on competitive ability of pasture grasses: spatial dynamics of six grasses in simulated swards. *Canadian Journal of Botany*; 72: 111-121.

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

- A. No 0
- B. Yes 3
- U. Unknown

Score 3

Documentation:
 Species:
Poa annua L., *P. pratensis* L., *P. trivialis* L. (USDA 2002, Whitson et al. 2000, Royer and Dickinson 1999, Hultén 1968).

Sources of information:

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee and R. Parker. 2000. Weeds of the West. The Western Society of Weed Science in cooperation with the Western United States Land Grant Universities, Cooperative Extension Services. University of Wyoming. Laramie, Wyoming. 630 pp.

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
- U. Unknown

Score

0

Documentation:

Describe type of habitat:

Canada bluegrass is a weed of waste places, roadsides, yards (Gubanov et al. 2003, Hultén 1968).

Rational:

Sources of information:

Gubanov, I.A., K.V. Kiseleva, V.S. Novikov and V.N. Tihomirov. An illustrated identification book of the plants of Middle Russia, Vol. 1: Vascular cryptograms, gymnosperms, angiosperms (monocots). Moscow: Institute of Technological Researches; 2003. 526 p. In Russian.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

Total Possible

25

Total

10

3. DISTRIBUTION

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

- A. No 0
- B. Is occasionally an agricultural pest 2
- C. Has been grown deliberately, bred, or is known as a significant agricultural pest 4
- U. Unknown

Score

4

Documentation:

Identify reason for selection, or evidence of weedy history:

Canada bluegrass is used as a pasture grass and for erosion control (Rutledge and McLendon 1996, Hitchcock and Cronquist 1973). However, it is not used as widely as Kentucky bluegrass (USDA 2002).

Rational:

Sources of information:

Hitchcock, C. L. and A. Cronquist. 1973. Flora of the Pacific Northwest: An Illustrated Manual. University of Washington Press, Seattle. 730 pp.

Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page.

<http://www.npwrc.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

3.2. Known level of ecological impact in natural areas

- A. Not known to cause impact in any other natural area 0
- B. Known to cause impacts in natural areas, but in dissimilar habitats and climate zones than exist in regions of Alaska 1
- C. Known to cause low impact in natural areas in similar habitats and climate zones to those present in Alaska 3
- D. Known to cause moderate impact in natural areas in similar habitat and climate zones 4
- E. Known to cause high impact in natural areas in similar habitat and climate zones 6
- U. Unknown

Score

Documentation:

Identify type of habitat and states or provinces where it occurs:

Canada bluegrass is known to cause little impact on native plant communities and successional processes in Rocky Mountain National Park, Colorado (Rutledge and McLendon 1996).

Sources of information:

Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

3.3. Role of anthropogenic and natural disturbance in establishment

- A. Requires anthropogenic disturbances to establish 0
- B. May occasionally establish in undisturbed areas but can readily establish in areas with natural disturbances 3
- C. Can establish independent of any known natural or anthropogenic disturbances 5
- U. Unknown

Score

Documentation:

Identify type of disturbance:

Canada bluegrass is much more capable of colonizing bare ground (Turkington 1994).

Rational:

Sources of information:

Turkington, R. 1994. Effect of propagule source on competitive ability of pasture grasses: spatial dynamics of six grasses in simulated swards. *Canadian Journal of Botany*; 72: 111-121.

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
- U. Unknown

Score

Documentation:

Describe distribution:

Canada bluegrass is native to Europe, western Asia, and Northern Africa (USDA, ARS 2005). It is introduced to North and South America, New Zealand, and eastern Asia (Gubanov et al. 2003, Hultén 1968).

Rational:

Sources of information:

Gubanov, I.A., K.V. Kiseleva, V.S. Novikov and V.N. Tihomirov. An illustrated identification book of the plants of Middle Russia, Vol. 1: Vascular cryptograms, gymnosperms, angiosperms (monocots). Moscow: Institute of Technological Researches; 2003. 526 p. In Russian.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?300618> [October 5, 2005].

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

- A. 0-5% of the states 0
- B. 6-20% of the states 2
- C. 21-50%, and/or state listed as a problem weed (e.g., “Noxious,” or “Invasive”) in 1 state or Canadian province 4
- D. Greater than 50%, and/or identified as “Noxious” in 2 or more states or Canadian provinces 5
- U. Unknown

Score 5

Documentation:

Identify states invaded:

Canada bluegrass is found in nearly all American states and Canadian provinces. This species is listed as an invasive weed in Connecticut (USDA 2002).

Rational:

Sources of information:

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Total Possible 25

Total 17

4. FEASIBILITY OF CONTROL

4.1. Seed banks

- A. Seeds remain viable in the soil for less than 3 years 0
- B. Seeds remain viable in the soil for between 3 and 5 years 2
- C. Seeds remain viable in the soil for 5 years and more 3
- U. Unknown

Score U

Documentation:

Identify longevity of seed bank:

Unknown

Rational:

Sources of information:

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
- U. Unknown

Score

2

Documentation:

Describe vegetative response:

Burning or grazing may result in increased resprouting (Rutledge and McLendon 1996).

Rational:

Sources of information:

Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page.
<http://www.npwrc.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

4.3. Level of effort required

- | | |
|---|---|
| A. Management is not required (e.g., species does not persist without repeated anthropogenic disturbance) | 0 |
| B. Management is relatively easy and inexpensive; requires a minor investment in human and financial resources | 2 |
| C. Management requires a major short-term investment of human and financial resources, or a moderate long-term investment | 3 |
| D. Management requires a major, long-term investment of human and financial resources | 4 |
| U. Unknown | |

Score

3

Documentation:

Identify types of control methods and time-term required:

Chemical methods and burning might be useful. Practices that will damage bluegrass may often harm the native species more (Butterfield et al. 1996, Sather 1996).

Rational:

Sources of information:

Butterfield, C., J. Stubbendieck and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page.
<http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm> (Version 16JUL97).
Sather, N. 1996. Element Stewardship Abstract for *Poa pratensis*, *Poa compressa* Kentucky Bluegrass, Canada Bluegrass. The Nature Conservancy. Arlington, VA.

Total Possible

7

Total

5

Total for 4 sections Possible

97

Total for 4 sections

38

References:

- Butterfield, C., J. Stubbendieck and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm> (Version 16JUL97).
- Dale, M.R., M.K. Ahmed, G. Jelenkovic and C.R. Funk. 1975. Characteristics and performance of interspecific hybrids between Kentucky bluegrass and Canada bluegrass. *Crop Science*; 15: 797-799.
- Dore, W.G. and J. McNeill. 1980. Grasses of Ontario. Monograph 26. Ottawa, Ontario: Biosystematics Research Institute, Research Branch Agriculture Canada.
- Gubanov, I.A., K.V. Kiseleva, V.S. Novikov and V.N. Tihomirov. An illustrated identification book of the plants of Middle Russia, Vol. 1: Vascular cryptograms, gymnosperms, angiosperms (monocots). Moscow: Institute of Technological Researches; 2003. 526 p. In Russian.
- Hitchcock, C. L. and A. Cronquist. 1973. *Flora of the Pacific Northwest: An Illustrated Manual*. University of Washington Press, Seattle. 730 pp.
- Hultén, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA. 1008 pp.
- Lapina, I. Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.
- Royer, F. and R. Dickinson. 1999. *Weeds of the Northern U.S. and Canada*. The University of Alberta press. 434 pp.
- Rutledge, C.R. and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science. Colorado State University. 97pp. Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.html> (Version 15Dec98).
- Sather, N. 1996. Element Stewardship Abstract for *Poa pratensis*, *Poa compressa* Kentucky Bluegrass, Canada Bluegrass. The Nature Conservancy. Arlington, VA.
- Turkington, R. 1994. Effect of propagule source on competitive ability of pasture grasses: spatial dynamics of six grasses in simulated swards. *Canadian Journal of Botany*; 72: 111-121.
- University of Alaska Museum. University of Alaska Fairbanks. 2003. <http://hispidamuseum.uaf.edu:8080/home.cfm>
- USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?300618> [October 5, 2005].
- Weeds of Alaska Database. 2004. AKEPIC Mapping Project Inventory Field Data. Alaska Natural Heritage Program, University of Alaska – US Forest Service – National Park Service. Available: <http://akweeds.uaa.alaska.edu/>
- Welsh, S.L. 1974. *Anderson's flora of Alaska and adjacent parts of Canada*. Brigham University Press. 724 pp.
- Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee, R. Parker. 2000. *Weeds of the West*. The Western Society of Weed Science in cooperation with the Western United States Land Grant Universities, Cooperative Extension Services. University of Wyoming. Laramie, Wyoming. 630 pp.