

WEED RISK ASSESSMENT FORM

Botanical name: *Achillea ptarmica* L.
 Common name: sneezewort, Russian daisy
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Outcome score:

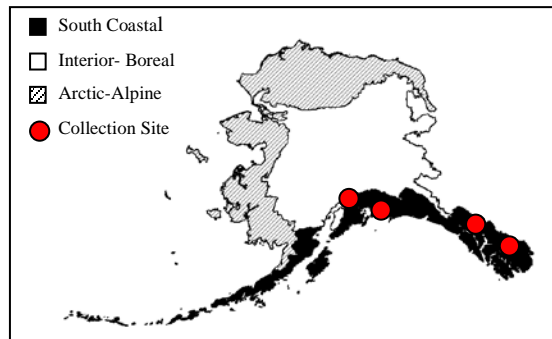
A. Climatic Comparison		
This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes
2	Interior-Boreal	Yes
3	Arctic-Alpine	Yes

B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	14
2	Biological characteristic and dispersal ability	25 (22)	11
3	Ecological amplitude and distribution	25 (25)	15
4	Feasibility of control	10 (3)	2
	Outcome score	100 (90) ^b	42 ^a
	Relative maximum score†		0.47

* 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
No	Arctic-Alpine



Documentation: *Achillea ptarmica* has been collected in Interior-Boreal and South Coastal ecogeographic regions of Alaska (AK Weeds Database 2004, Hultén 1968, UAF 2004).
 Sources of information:
 AK Weeds Database. 2004. 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/>
 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>

- 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

Yes

Documentation: This species is known to occur as far north in Europe as the northern province in Norway (Finnmark) at 70°N (Lid and Lid 1994). This region is recognized as having arctic tundra vegetation (CAFF Circumpolar Arctic Vegetation Map), and it is therefore possible for this taxon to establish in the Arctic-Alpine ecoregion of Alaska.
 Sources of information:
 Conservation of Arctic Flora and Fauna. YEAR. Circumpolar Arctic Vegetation Map. Accessed at <http://www.caff.is/>
 Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.

B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on 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

3

Documentation:
 Identify ecosystem processes impacted:
 Ecosystem impacts are largely unknown. Dense patches of sneezewort likely reduce nutrient, moisture, or light availability for other plant species.
 Rational:

Sources of information:

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 3

Documentation:

Identify type of impact or alteration:

This species appears to mildly increase the density of the herbaceous layer along roadsides in south-central Alaska (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.

1.3. 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 3

Documentation:

Identify type of impact or alteration:

It is unknown if sneezewort causes changes in native populations. This species can hybridize with native species of *Achillea* (Hurteau and Briggs 2003, Plants for a future 2002) and may therefore pose a genetic risk. Current population sizes in Alaska are small and not particularly dense, suggesting the effects of its presence on individual native species is minor (I. Lapina – pers. obs.).

Rational:

Sources of information:

Hurteau, M.D. and R. Briggs. 2003. Common yarrow - *Achillea millefolium* L. Plant fact sheet. United States Department of Agriculture. Available: <http://plants.usda.gov> [13 December, 2004].

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

Plants for a future. 2002. *Achillea ptarmica*. Available:

http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Achillea+ptarmica&CAN=LATIND [January 20, 2005].

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

5

Documentation:

Identify type of impact or alteration:

Sneezewort is a host for numerous aphid, nematode, virus, and fungi species (MacLachlan et al. 1996). It is pollinated by bees and flies (Plants for a future 2002), and its presence may therefore alter local pollination ecology.

Rational:

Sources of information:

MacLachlan, W., S. Gill, E. Dutky, R. Balge, and S. Klick. 1996. Production of yarrows as cut flowers. College of Agriculture and Natural Resources, University of Maryland. Available:

<http://www.agnr.umd.edu/MCE/Publications/> [January 20, 2005].

Plants for a future. 2002. *Achillea ptarmica*. Available:

http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Achillea+ptarmica&CAN=LATIND [January 20, 2005].

Total Possible

40

Total

14

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

3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Sneezewort reproduces by abundant seeds and branching rhizomes (Lid and Lid 1994).

Rational:

Sources of information:

Lid, J. and D. T. Lid. 1994. *Flora of Norway*. The Norske Samlaget, Oslo. Pp. 1014.

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

0

Documentation:

Identify dispersal mechanisms:

Seeds lack pappus and are not dispersed long distances.

Rational:

Sources of information:

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

Documentation:

Identify dispersal mechanisms:

Sneezewort is cultivated as an ornamental, which has escaped cultivation (Welsh 1974)

Rational:

Sources of information:

Welsh, S. L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

2.4. Allelopathic

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

Score

Documentation:

Describe effect on adjacent plants:

This species is not known to be allelopathic.

Rational:

Sources of information:

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

Documentation:

Evidence of competitive ability:

Unknown.

Rational:

Sources of information:

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

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

Score

Documentation:

Describe grow form:

This species is rhizomatous, but does not grow into impenetrable thickets (I. Lapina – pers. obs.).

Rational:

Sources of information:

Lapina, I. Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage,

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:

Germination of *Achillea* species is improved by exposure to light (MacLachlan et al. 1996). This suggests that seed germination in established vegetation is less likely.

Rational:

Sources of information:

MacLachlan, W., S. Gill, E. Dutky, R. Balge, and S. Klick. 1996. Production of yarrows as cut flowers. College of Agriculture and Natural Resources, University of Maryland. Available: <http://www.agnr.umd.edu/MCE/Publications/> [January 20, 2005].

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

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

Score

3

Documentation:

Species:

Achillea filipendulina Lam. and *A. millefolium* var. *millefolium* L. are two introduced and weedy species in Alaska. *Achillea millefolium* var. *millefolium* is declared noxious in Alaska (Invaders Database System 2003) and is considered a weed in Manitoba (Royer and Dickinson 1999).

Sources of information:

Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agricultural. <http://invader.dbs.umt.edu/>
Royer, F., and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.

2.9. Aquatic, wetland, or riparian species

- A. Not invasive in wetland communities 0
- B. Invasive in wetland communities 3
- U. Unknown

Score

3

Documentation:

Describe type of habitat:

While rarely observed in riparian habitats in North America, this species is often associated with wet meadows, marshes, and stream banks in Europe (Gubanov et al. 1995).

Rational:

Sources of information:

Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Center European Russia. Moscow. Argus. 558 pp.

Total Possible

22

Total

11

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:

This species is grown as an ornamental and has escaped cultivation. A number of varieties have been bred (MacLachlan et al. 1996).

Rational:

Sources of information:

MacLachlan, W., S. Gill, E. Dutky, R. Balge, and S. Klick. 1996. Production of yarrows as cut flowers. College of Agriculture and Natural Resources, University of Maryland. Available: <http://www.agnr.umd.edu/MCE/Publications/> [January 20, 2005].

3.2. Known level of 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 3

Documentation:

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

This species is known to have spread into meadows of northern Norway, but is only found occasionally (Lid and Lid 1994).

Sources of information:

Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.

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 1

Documentation:

Identify type of disturbance:

Sneezewort occurs in the Matanuska-Susitna Valley along the forest edges and areas that have been disturbed decades ago (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.

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 5

Documentation:

Describe distribution:

Sneezewort is native to central Europe; it is now widespread in North America and it is known from Tasmania (Csurshes and Edwards 1998). It is known to occur in arctic/subarctic regions of Scandinavia (Lid and Lid 1994).

Rational:

Sources of information:

Csurhes, S. and R. Edwards. 1998. Potential environmental weeds in Australia: *Achillea ptarmica* L. Queensland Department of Natural Resources, Australian Government, Department of the Environment and Heritage.

Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.

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

2

Documentation:

Identify states invaded:

This species is known from 17 of the northern United States (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

15

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:

No information was available on seed longevity.

Rational:

Sources of information:

4.2. Vegetative regeneration

- A. No resprouting following removal of aboveground growth 0
- B. Sprouts from roots or stumps 2
- C. Any plant part is a viable propagule 3
- U. Unknown

Score

2

Documentation:

Describe vegetative response:

This species is rhizomatous.

Rational:

Sources of information:

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

U

Documentation:

Identify types of control methods and time-term required:

Unknown. Control measures do not appear to have been investigated for this taxon

Rational:

Sources of information:

Total Possible

3

Total

2

Total for 4 sections Possible

90

Total for 4 sections

42

References:

- Conservation of Arctic Flora and Fauna. YEAR. Circumpolar Arctic Vegetation Map. Accessed at <http://www.caff.is/>
- Csurhes, S. and R. Edwards. 1998. Potential environmental weeds in Australia: *Achillea ptarmica* L. Queensland Department of Natural Resources, Australian Government, Department of the Environment and Heritage.
- Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Center European Russia. Moscow. Argus. 558 pp.
- Hurteau, M.D. and R. Briggs. 2003. Common yarrow - *Achillea millefolium* L. Plant fact sheet. United States Department of Agriculture. Available: <http://plants.usda.gov> [13 December, 2004].
- Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 pp.
- Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agricultural. <http://invader.dbs.umt.edu/>
- Lapina, I. Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.
- Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.
- MacLachlan, W., S. Gill, E. Dutky, R. Balge, and S. Klick. 1996. Production of yarrows as cut flowers. College of Agriculture and Natural Resources, University of Maryland. Available: <http://www.agnr.umd.edu/MCE/Publications/> [January 20, 2005].
- Plants for a future. 2002. *Achillea ptarmica*. Available: http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Achillea+ptarmica&CAN=LATIND [January 20, 2005].

- Royer, F., and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
- 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.
- Welsh, S. L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.