

WEED RISK ASSESSMENT FORM

Botanical name: *Saponaria officinalis* L.
 Common name: bouncingbet, soapwort, sweet betty
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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	No
This species is unlikely to establish in any region in Alaska		

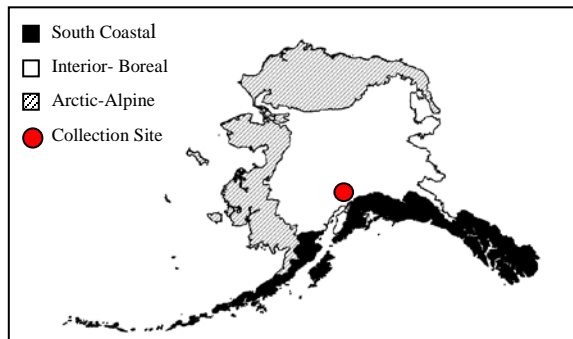
B. Invasiveness Ranking	Total (Total Answered*)	Total
	Possible	
1	Ecological impact	40 (30) / 5
2	Biological characteristic and dispersal ability	25 (22) / 8
3	Ecological amplitude and distribution	25 (25) / 12
4	Feasibility of control	10 (3) / 2
	Outcome score	100 (80) ^b / 27
	Relative maximum score [†]	0.34

* 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>	
	South Coastal
Yes	Interior-Boreal
	Arctic-Alpine



Documentation: *Saponaria officinalis* was collected in Wasilla (Interior-Boreal ecoregion - AKNHP 2003).
 Sources of information:
 AKNHP. 2003. Non-native plants survey of Mat-Su Valleys. Report for USFS, State and Private Forestry, Anchorage, AK.

- 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 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: *Saponaria officinalis* is common along the southern coast of Norway, including Bergen (Lid and Lid 1994), which has a 73% climatic match (CLIMEX 1999) with Juneau, Alaska (South-Coastal ecoregion). It is therefore likely to be able to establish in this ecoregion. This species is documented from the high elevation Norwegian provinces of Oppland and Hedmark, adjacent to Røros, which has a 76% similarity with Nome (Faarlund and Sunding 1992, Lid and Lid 1994). However, according to the USDA (2002), 130 frost free days are required and plants can withstand a minimum temperature of -18°F. It is therefore unlikely to establish in the Arctic-Alpine ecoregion and much of the Interior-Boreal ecoregion.
 Sources of information:
 CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.
 Faarlund, T., and P. Sunding. 1992. Store illustrete flora for Norge og Nord-Europa. Teknologisk Forlag, Oslo. Pp. 544.
 Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.
 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.

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

U

Documentation:
 Identify ecosystem processes impacted:
 No information was found identifying impacts to ecosystem processes.
 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 1

Documentation:

Identify type of impact or alteration:

Establishes in an existing layer without significant changes the density of other species. It is capable of creation of a new layer on recently disturbed soil (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 1

Documentation:

Identify type of impact or alteration:

The plants can form large populations and completely dominate on disturbed sites (OPBWG 2004). However, in south-central Alaska it occurs in sparse populations in natural communities (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.
OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

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 3

Documentation:

Identify type of impact or alteration:

Roots and seeds are slightly poisonous to human and animals (Russell 1997). Animals typically avoid eating this plant. There is a potential for drawing pollinating insects from native species to visit *S. officinalis* (OPBWG 2004, Whitson et al. 2000).

Rational:

All parts of the plant contain saponins.

Sources of information:

OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

Russell A. B. 1997. Poisonous plants of North Carolina. Department of Horticultural Science, North Carolina State University.

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.

Total Possible	30
Total	5

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/m ²)) | 1 |
| C. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m ²) | 2 |
| D. Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m ²) | 3 |
| U. Unknown | |

Score

3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Bouncingbet reproduces by seeds and spreading underground stems (OPBWG 2004). The average number of ovules per fruit was 75, and seeds produced per fruit was 50 for a potential of 1,500 seeds/plant (I. Lapina and M.L. Carlson unpubl. data).

Rational:

Sources of information:

Carlson, M.L., Ph.D., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790.

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

OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

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:

Saponaria officinalis does not have any apparent adaptations for long-distance dispersal; its seeds are not winged or plumed seeds for wind dispersal and the fruits do not appear adapted to frugivory (M. L. Carlson – pers. obs.), but it does disperse from gardens.

Rational:

Sources of information:

Carlson, M. L., Assistant Research Professor, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.

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:

Hay and other feeds can be contaminated by seeds or other plants parts. It also appears for sale in nurseries and is well documented to escape from gardens in northern Europe (Lid and Lid 1994).

Rational:

Sources of information:

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

2.4. Allelopathic

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

Score **0**

Documentation:

Describe effect on adjacent plants:

This species is not allelopathic.

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 **1**

Documentation:

Evidence of competitive ability:
 It spreads rapidly and replaces plants of other species (Whitson et al. 2000). Its competitive ability in Alaska is questionable as it is primarily restricted to a single highly disturbed site (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.
 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.

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 1

Documentation:
 Describe grow form:
 The plant has tendency to form large and dense patches (OPBWG 2004), but does not climb or produce a smothering growth-form.
 Rational:

Sources of information:
 OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

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 U

Documentation:
 Describe germination requirements:
 No information was found identifying germination requirements.
 Rational:

Sources of information:

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

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

Score 0

Documentation:
 Species:
 No other weedy *Saponaria* species are present
 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.

2.9. Aquatic or wetland 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:

Saponaria officinalis typically grows along roadsides, railroads, waste places, fields and pastures.

Rational:

Sources of information:

OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

Total Possible

22

Total

8

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:

It was introduced for ornamental and soap-like properties (OPBWG 2004). A Few cultivars have been developed (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 Central European Russia. Moscow. Argus. 558 pp.
OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

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

1

Documentation:

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

It appears to grow in nearly all states (USDA 2002), but impacts tend to be of highly disturbed areas unlike most natural areas in Alaska.

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.

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

3

Documentation:

Identify type of disturbance:

This species typically establishes in disturbed sites.

Rational:

Sources of information:

OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].

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

0

Documentation:

Describe distribution:

Native to central and southern Europe, but has spread throughout western and northern Europe (Faarlund and Sunding 1992). This species has become naturalized in northern Europe, originating from ballast and escaped ornamentals (Lid and Lid 1994).

Rational:

Sources of information:

Faarlund, and Sunding. 1992. Illustrated Flora of Norway and Northern Europe. Domino Books, Ltd., Jersey. Pp. 544.

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

4

Documentation:

Identify states invaded:

The species occurs in nearly all states of the United States (USDA 2002). Listed as noxious weed in Colorado (Invaders Database System 2003). “Exotic Pest” in California, “Weed” in Kentucky (USDA 2002).

Rational:

Sources of information:

Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. <http://invader.dbs.umt.edu/>
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	12

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 found identifying seed longevity

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:

Has the ability to resprout and can be propagated by sprigs (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.

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:

Control options have not been investigated. One population in south-central Alaska was seeded for erosion control after road construction, the following spring no seedlings were observed (I. Lapina – pers. obs., J. Riley – pers. com.). It is possible that this species will not persists in Alaska

Rational:

Sources of information:

Lapina, L. botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710) – Pers. obs.
Riley, J., Horticulture Agent, UAF Cooperative Extension Service, 2221 E. Northern Lights Blvd. #118, Anchorage, AK 99508-4143, tel: (907) 786-6306 – pers. com.

Total Possible	3
Total	2

Total for 4 sections Possible	80
Total for 4 sections	27

References:

- AKNHP. 2003. Non-native plants survey of Mat-Su Valleys. Report for USFS, State and Private Forestry, Anchorage, AK.
- Carlson, M. L., Assistant Research Professor, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.
- CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.
- Faarlund, and Sunding. 1992. Illustrated Flora of Norway and Northern Europe. Domino Books, Ltd., Jersey. Pp. 544.
- Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Central European Russia. Moscow. Argus. 558 pp.
- Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. <http://invader.dbs.umt.edu/>
- Lapina, L. 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.
- OPBWG - Ohio Perennial and Biennial Weed Guide – Bouncingbet. The Ohio State University. Available: <http://www.oardc.ohio-state.edu/weedguide/listall.asp> [15 April 2004].
- Riley, J., Horticulture Agent, UAF Cooperative Extension Service, 2221 E. Northern Lights Blvd. #118, Anchorage, AK 99508-4143, tel: (907) 786-6306 – pers. comm.
- Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
- Russell A. B. 1997. Poisonous plants of North Carolina. Department of Horticultural Science, North Carolina State University.
- 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, 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.