

WEED RISK ASSESSMENT FORM

| | | |
|-----------------|---|---|
| Botanical name: | <i>Melilotus officinalis</i> (L.) Lam. | |
| Common name: | Yellow sweetclover | |
| Assessors: | Irina Lapina Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska 99501 tel: (907) 257-2710; fax (907) 257-2789 | Matthew L. Carlson, Ph.D. Assistant Professor, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska 99501 tel: (907) 257-2790; fax (907) 257-2789 |
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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 | |
| This species is unlikely to establish in any region in Alaska | | |

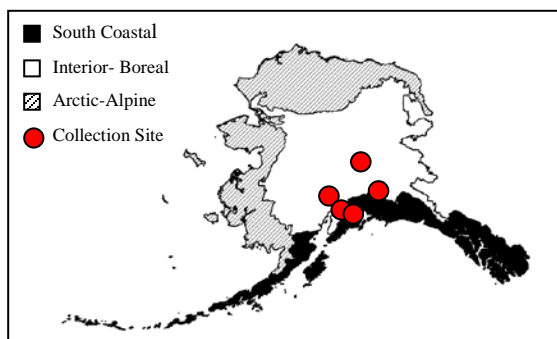
| B. | Invasiveness Ranking | Total (Total Answered*) Possible | Total |
|----|---|-------------------------------------|-------|
| 1 | Ecological impact | 40 (40) | 20 |
| 2 | Biological characteristic and dispersal ability | 25 (25) | 18 |
| 3 | Ecological amplitude and distribution | 25 (25) | 19 |
| 4 | Feasibility of control | 10 (10) | 8 |
| | Outcome score | 100 (100) ^b | 65 |
| | Relative maximum score [†] | | 0.65 |

* 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: Has been collected in Anchorage and Fairbanks (Hultén 1968), McCarthy (Interior ecoregion and Seward, Whittier (South Coastal ecoregion) (AKEPIC 2004, UAM 2004). It does not appear to have been documented in the Arctic-Alpine ecoregion.

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

No

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

Documentation: Using CLIMEX matching program, climatic similarity between Nome and areas where the species is documented has a moderate match. There is a 57% similarity between Nome and Östersund, Sweden (CLIMEX 1999) where this species has been collected (Natur Historiska Riksmuseet Database 2004). Additionally, there is a 76% similarity between Nome and Røros, Norway, where the species is documented (Hultén 1968). The range of *M. officinalis* includes Zlatoust, Russia, and Stensele, Sweden (Hultén 1968) which have 71% and 70% of climatic matches with Nome respectively. This suggests that establishment in arctic and alpine regions of Alaska may be possible.

Sources of information:

CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.

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

Natur Historiska Riksmuseet Database. 2004. <http://www.nrm.se/wise/>

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

| |
|---|
| 7 |
|---|

Documentation:

Identify ecosystem processes impacted:

Yellow sweetclover is known to alter soil conditions due to nitrogen fixation and

reducing erosion. It has the potential to inhibit natural succession processes (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).

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:

Yellow sweetclover is known to degrade natural grassland communities (Wisconsin DNR 2003) and is a persistent part of understory vegetation in cottonwood and juniper woodlands, but does not form a major component of the ground cover (Sullivan 1992)

Rational:

Sources of information:

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].
Wisconsin Department of Natural Resources. 2003. Yellow sweet clover (*Melilotus officinalis*) White sweet clover (*Melilotus alba*). www.dnr.state.wi.us/org/land/er/invasive/factsheet/clovers.htm

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:

Yellow sweetclover has ability to shade out native herbaceous species (Townsend 2001).

Rational:

Sources of information:

Townsend, J.F. 2001. Plant species invasiveness rank form for *Melilotus officinalis*. In: Heffernan, K.E., P.P. Coulling, J.E. Townsend, and C.J. Hutto. 2001. Ranking Invasive Exotic Plant Species in Virginia. Natural Heritage Technical Report 01-13. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. 27pp. plus appendices.

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

| |
|---|
| 7 |
|---|

Documentation:

Identify type of impact or alteration:

Yellow sweetclover is eaten by elk, deer, and domestic livestock (Sullivan 1992). It is visited by introduced honeybees, native solitary bees, wasps, and flies (Eckardt 1987). It is moderately toxic to animals (Whitson et al. 2000) and allelopathic (USDA 2002).
Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 pp.

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].

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.

Total Possible

| |
|----|
| 40 |
|----|

Total

| |
|----|
| 20 |
|----|

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):

Yellow sweetclover reproduces by copious amounts of seeds. Plant can produce 14,000 to 350,000 seeds per year (Rutledge and McLendon 1996). Plant does not reproduce vegetatively.

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:

Seeds of yellow sweetclover may be dispersed by water, although wind can blow seeds up to several meters (Eckardt 1987, Rutledge and McLendon. 1996).

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 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).

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:

Yellow sweetclover has spread from cultivation (Densmore et al. 2001, Welsh 1974). It may contaminate cereal grains and can spread from vehicle tires. (Densmore et al. 2001). Yellow sweetclover is sometimes promoted for soil stabilization or soil improvement (Whitson 2000).

Rational:

Used as forage crop, soil builder, erosion stabilizer, and nectar source for honeybees

Sources of information:

Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 pp.

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.

2.4. Allelopathic

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

Score 2

Documentation:

Describe effect on adjacent plants:

Yellow sweetclover is listed as an allelopathic in PLANTS Database (USDA 2002). Sweetclover roots contain substances allelopathic to *Agropyron cristatum*, *Bromus inermis*, and *Phleum pretense* (Sullivan 1992).

Rational:

Sources of information:

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].

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 2

Documentation:

Evidence of competitive ability:

Yellow sweetclover may compete with native species (Densmore et al. 2001, Eckardt 1987), and has high nitrogen fixing ability (USDA 2002).

Rational:

Sources of information:

Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 pp.

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 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.

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 2

Documentation:

Describe grow form:

Yellow sweetclover is a plant with stems up to 6 feet tall (Welsh 1974, Whitson 2000) and forms dense mono-specific stands.

Rational:

Sources of information:

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.

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

Documentation:

Describe germination requirements:

Yellow sweetclover requires open soil for germination (Densmore et al. 2001).

Rational:

Sources of information:

Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 pp.

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

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

Score

Documentation:

Species:

Melilotus alba Medikus

Sources of information:

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

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, 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

Documentation:

Describe type of habitat:

Yellow sweetclover is a weed of pastures, roadsides, neglected fields, and waste places. It can be found in open disturbed, upland habitats such as prairies, savannas, and dunes (Wisconsin DNR 2003, Whitson 2000). However, one site of infestation was an acidic wetland in the lower Susitna Valley, Alaska (Weeds of Alaska Database 2004, I. Lapina - pers. obs.)

Rational:

Sources of information:

I. Lapina, Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710) – Pers. obs.
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/>
 Wisconsin Department of Natural Resources. 2003. Yellow sweet clover (*Melilotus officinalis*) White sweet clover (*Melilotus alba*).
www.dnr.state.wi.us/org/land/er/invasive/factsheet/clovers.htm
 Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee and 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 | 25 |
| Total | 18 |

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:

Yellow sweetclover is important forage, hay, and pasture species and have spread from cultivation Also it is widely used for stabilization of disturbed sites (Densmore et al. 2001, Sullivan 1992, Whitson 2000).

Rational:

Sources of information:

Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 pp.

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].

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.

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

| |
|---|
| 4 |
|---|

Documentation:

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

Yellow sweetclover invades valleys and prairies in Illinois, Iowa, Minnesota, Missouri, North Dakota, and Wisconsin (Eckardt 1987) as well as Douglas fir, lodgepole pine, and grasslands of the West and Mid-West (Sullivan 1992)

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 pp.

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].

Wisconsin Department of Natural Resources. 2003. Yellow sweet clover (*Melilotus officinalis*) White sweet clover (*Melilotus alba*). www.dnr.state.wi.us/org/land/er/invasive/factsheet/clovers.htm.

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:

Yellow sweetclover tends to be eliminated in shaded sites, although it will persist on sites with periodic disturbances (Sullivan 1992). Burning stimulates germination by scarifying seeds and yellow sweetclover will colonize areas disturbed by fire (Wisconsin DNR 2003).

Rational:

Sullivan, J. 1992. *Melilotus officinalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2004, March 31].

Wisconsin Department of Natural Resources. 2003. Yellow sweet clover (*Melilotus officinalis*) White sweet clover (*Melilotus alba*). www.dnr.state.wi.us/org/land/er/invasive/factsheet/clovers.htm

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 3

Documentation:

Describe distribution:

Yellow sweetclover is a native to the Mediterranean area through central Europe to Tibet (Eckardt 1987). It was introduced into North and South America (Hultén 1968).

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 pp.

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

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:

The species is found in all fifty states (Wisconsin DNR 2003). It is declared noxious in Quebec (Invaders Database System 2003).

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/>

Wisconsin Department of Natural Resources. 2003. Yellow sweet clover (*Melilotus officinalis*) White sweet clover (*Melilotus alba*).

www.dnr.state.wi.us/org/land/er/invasive/factsheet/clovers.htm

| | |
|----------------|----|
| Total Possible | 25 |
| Total | 19 |

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

| |
|---|
| 3 |
|---|

Documentation:

Identify longevity of seed bank:

Seeds can remain viable in the soil for 11 to 50 years (Cole 1991, Eckardt 1987, Rutledge and McLendon 1996).

Rational:

Sources of information:

Cole, M.A.R. Vegetation management guideline: white and yellow sweet clover (*Melilotus alba* Desr. and *Melilotus officinalis* (L.) Lam.). Natural Areas Journal 11(4): 214-215.

Eckardt, N. 1987. Element stewardship abstract for *Melilotus officinalis*. The Nature Conservancy, Minneapolis. 10 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.npwr.usgs.gov/resource/othrdata/Explant/explant.htm> (Version 15DEC98).

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

| |
|---|
| 1 |
|---|

Documentation:

Describe vegetative response:

Plants usually do not resprout when the stems are cut close to the ground (Cole 1991).

Rational:

Sources of information:

Cole, M.A.R. Vegetation management guideline: white and yellow sweet clover (*Melilotus alba* Desr. and *Melilotus officinalis* (L.) Lam.). Natural Areas Journal 11(4): 214-215.

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

| |
|---|
| 4 |
|---|

Documentation:

Identify types of control methods and time-term required:

Yellow sweetclover can be managed using mechanical or burning methods. Due to the long viability of seeds, sites must be managed on continuous basis (Cole 1991, Wisconsin DNR 2003).

Rational:

Sources of information:

Cole, M.A.R. 1991. Vegetation management guideline: white and yellow sweet clover (*Melilotus alba* Desr. and *Melilotus officinalis* (L.) Lam.). Natural Areas Journal 11(4): 214-215.

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Total Possible

| |
|----|
| 10 |
|----|

Total

| |
|---|
| 8 |
|---|

Total for 4 sections Possible

| |
|-----|
| 100 |
|-----|

Total for 4 sections

| |
|----|
| 65 |
|----|

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