

WEED RISK ASSESSMENT FORM

Botanical name: Melilotus alba Medikus

Common name: white sweetclover

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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		

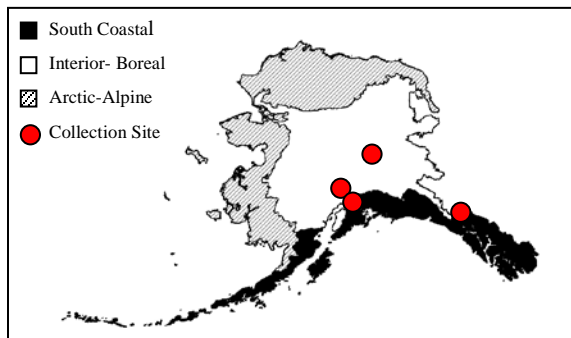
B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	29
2	Biological characteristic and dispersal ability	25 (25)	21
3	Ecological amplitude and distribution	25 (25)	21
4	Feasibility of control	10 (10)	9
	Outcome score	100 (100) ^b	80 ^a
	Relative maximum score†		0.80

* 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)?
 Proceed to Section B. Invasiveness Ranking.
- Yes South Coastal
 Yes Interior-Boreal
 No Arctic-Alpine



Documentation: *Melilotus alba* has been collected in South Coastal (Skagway – Hultén 1968), Interior-Boreal (Anchorage, Fairbanks – UAM 2004, Hultén 1968, Wasilla – AKNHP 2003), ecoregions in Alaska. It does not appear to have been documented in the Arctic-Alpine ecoregion.

Sources of information:

AKNHP. 2003. Non-native plants survey of Mat-Su Valleys. Report for USFS, State and Private Forestry, Anchorage, AK.

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 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 the high elevation, northerly city of Östersund, Jämtland, Sweden, where records of collections exist (Natur Historiska Riksmuseet Database, 2004). Additionally, *Melilotus alba* has been collected from Fort McMurray, Alberta, Churchill Manitoba, and Kirov, Russia (Hultén 1968) which have high climatic matches with Nome. 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.

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

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

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

10

Documentation:

Identify ecosystem processes impacted:

White sweetclover is known to alter soil conditions due to nitrogen fixation and reducing erosion (USDA 2002). It is possible it may affect the ecology and presence of early successional habitats (Rutledge & McLendon 1996). It has potential to alter sedimentation rates of river ecosystems (M. Shephard – pers. comm.).

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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm> (Version 15DEC98).

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. comm.

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.

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 7

Documentation:

Identify type of impact or alteration:

White sweetclover forms dense monospecific stands in Alaska (Conn 2003), and is known to degrade natural grassland communities (Eckhardt 1987, Wisconsin DNR 2003)

Rational:

Sources of information:

Conn, J. 2003. White sweet clover invasions on Alaskan rivers. Paper presented at 2003 Alaska Noxious and Invasive Plants Management Workshop. Anchorage, Alaska.

Eckhardt, N. 1987. The Nature Conservancy's element stewardship abstract for *Melilotus alba* and *Melilotus officinalis*.

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 5

Documentation:

Identify type of impact or alteration:

No known documentation of alteration of community composition, but based on personal observation (I. Lapina – pers. obs., M. Carlson – pers. obs.) very few native species occur under the canopy of white sweetclover. However, it is probable that early successional species along rivers in Alaska are negatively affected by shading.

Rational:

Sources of information:

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

7

Documentation:

Identify type of impact or alteration:

White sweetclover is reported to be toxic to horses, cattle, sheep, when improperly dried (CUPPID 2003). This species has high palatability for wildlife herbivores (birds as well as small and large mammals) (Uchytel 1992). Though moose do not browse on white sweetclover (Conn – pers. obs., Shephard – pers. obs.). White sweetclover is visited by introduced honeybees, native solitary bees, wasps, and flies (Eckardt 1987). It is associated with over 28 viral diseases (Royer and Dickinson 1999).

Rational:

Contains coumarin and dicoumarol.

Sources of information:

Conn, J. Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184 – Pers. comm.

CUPPID - Cornell University: Poisonous Plants Informational Database. <http://www.ansci.cornell.edu> [Oct 29, 2003].

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. The Nature Conservancy, Minneapolis. 10 pp.

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

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. com.

Uchytel, Ronald J. 1992. *Melilotus alba*. 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/> [2006, February 10].

Total Possible	40
Total	29

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
-

Documentation:

Describe key reproductive characteristics (including seeds per plant):

White sweetclover produces 14,000 to 350,000 seeds per plant, no vegetative preproduction (Royer and Dickinson 1999, Rutledge and McLendon 1996, USDA 2002).

Rational:

Sources of information:

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. 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.**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 | |

Documentation:

Identify dispersal mechanisms:

Rainwater runoff and stream flow are probably the most important means of seed dispersal (Eckardt 1987, Rutledge and McLendon 1996, Shephard – pers.com.).

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. 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).

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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:

White sweetclover has spread from cultivation (Eckhardt 1987, Wisconsin DNR 2003). It also contaminates cereal grains (Royer & Dickinson 1999) and can spread from vehicle tires (Densmore et al. 2001).

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.

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. The Nature Conservancy, Minneapolis. 10 pp.

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

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

2.4. Allelopathic

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

Score **2**

Documentation:

Describe effect on adjacent plants:

White sweetclover is allelopathic (USDA, NRCS 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 **3**

Documentation:

Evidence of competitive ability:

White sweetclover competes for resources with native species and has high nitrogen fixing ability (Eckardt 1987, USDA, NRCS 2002).

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. 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:

White sweetclover forms dense tall thickets (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.

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:

White sweetclover has only been observed in areas with predominantly mineral soil (Conn 2003, I. Lapina – pers. obs., M. Carlson - pers. obs.). Plants are shade intolerant as well (USDA 2002)

Rational:

Sources of information:

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

Conn, J. 2003. White sweet clover invasions on Alaskan rivers. Paper presented at 2003 Alaska Noxious and Invasive Plants Management Workshop. Anchorage, Alaska.

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

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.

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

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

Score 3

Documentation:

Species:

Melilotus officinalis (L.) Lam is listed as a weed (Eckardt 1987, USDA, NRCS 2002).

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. 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.

2.9. 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

3

Documentation:

Describe type of habitat:

White sweetclover has been observed invading thousand acres along river system: Nenena, Stikine, Matanuska (Conn 2003, Shephard - pers. com.). The tendency of seed to disperse by water indicates that herbaceous riverine communities can be altered by invasion of *M. alba*. However, this taxon is intolerant of consistently wet, non-well drained substrates (Heffernan et al. 2001)

Rational:

Sources of information:

Conn, J. 2003. White sweet clover invasions on Alaskan rivers. Paper presented at 2003 Alaska Noxious and Invasive Plants Management Workshop. Anchorage, Alaska.

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.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454. – Pers. com.

Total Possible

25

Total

21

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:

White sweetclover has been extensively used by forage crop, soil builder, and as a nectar source for honey bees (Eckardt 1987). A cold tolerant variety has been bred and is establishing in Alaskan Parks (Densmore et al. 2001)

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. The Nature Conservancy, Minneapolis. 10 pp.

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.

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:

White sweetclover has invaded sand dunes and gravel bars along the Stikine River (Tongass National Forest, Alaska – Stensvold 2000, Spencer –pers. observ.); and Nenena and Matanushka river in south central (Conn 2003). It has invaded rivers systems in Alaska, aspen woodlands in Rocky Mountain National Park, Colorado (Rutledge and McLendon 1996). It has been found in mid-successional sites that were disturbed in the last 11-50 years (Pipestone National Monument, Minnesota – Butterfield et al. 1996).

Sources of information:

Conn, J. 2003. White sweet clover invasions on Alaskan rivers. Paper presented at 2003 Alaska Noxious and Invasive Plants Management Workshop. Anchorage, Alaska.

Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstracts 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).

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).

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454. – Pers. comm.

Spencer, P. Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448.

Stensvold, M. 2000. Noxious weed surveys and projects conducted on the Tongass National Forest 1997-2000. Technical report on file, Tongass National Forest. Pp 2.

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:

White sweetclover readily invades open areas. Natural or human-caused fires promote invasion by scarifying seeds and stimulating germination. The clearings in forested land are easily colonized by *Melilotus*. Resprouts readily when cut or grazed (Eckardt 1987, Wisconsin DNR 2003).

Rational:

Sources of information:

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. The Nature Conservancy, Minneapolis. 10 pp.

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

5

Documentation:

Describe distribution:

White sweetclover is native to the Mediterranean area through central Europe to Tibet. It is introduced into South Africa, North and South America, New Zealand, Australia, and Tasmania (Hultén 1968).

Rational:

Sources of information:

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:

White sweetclover is found in all 50 states and all but two Canadian provinces. It is listed as “Exotic Pest” in Tennessee, “Ecologically Invasive” in Wisconsin, “Weed” in Kentucky and Quebec, Canada (Royer and Dickinson 1999, USDA, NRCS 2002).

Rational:

Sources of information:

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.

Total Possible

25

Total

21

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 of white sweetclover can remain viable in the soil for 11-50 years and up to 81 years (Butterfield et al. 1996, J. Conn – pers. com., Royer and Dickinson 1999, Rutledge and McLendon 1991).

Rational:

Sources of information:

Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstracts 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).

Conn, J., Weed Scientist, USDA Agricultural Research Service, P.O. Box 757200, Fairbanks, Alaska 99775-7200. Tel: (907) 474 2423. – Pers. comm.

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. 97 pp. Northern Prairie Wildlife Research Center Home Page.
<http://www.npwrc.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

2

Documentation:

Describe vegetative response:

White sweetclover resprouts readily when burn, cut or grazed (Butterfield et al., 1996, Wisconsin DNR 2003). However, Densmore et al. (2001) reports that it does not resprout.

Rational:

Sources of information:

Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstracts 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).

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.

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.

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:

Management requires a long-term investment due to long seed viability and density patches. Plant can be managed using mechanical and chemical control methods. Several treatments may be necessary. Sites must be monitored. Remote sites especially

difficult to control (J. Conn – pers. com., Eckardt 1987).

Rational:

Sources of information:

Conn, J., Weed Scientist, USDA Agricultural Research Service, P.O. Box 757200, Fairbanks, Alaska 99775-7200. Tel: (907) 474 2423. – Pers. comm.

Eckardt, N. 1987. Element stewardship abstract for *Melilotus alba* – sweetclover or white sweetclover, *Melilotus officinalis* – yellow sweetclover. The Nature Conservancy, Minneapolis. 10 pp.

Total Possible	10
Total	9

Total for 4 sections Possible	100
Total for 4 sections	80

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