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MANAGEMENT PLAN FOR WILD INDIGO SCIENTIFIC AND NATURAL AREA

"A portion of the former railroad bed and right-of-way of the Chicago Milwaukee St. Paul and Pacific Railroad between the Red Cedar River and Dexter in Mower County"

> Prepared by The Scientific and Natural Area Program Section of Fish and Wildlife Minnesota Department of Natural Resources

> > December 1983

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This SCIENTIFIC and NATURAL AREA was established to protect and perpetuate Minnesota's rare and unique natural resources for nature observation, education and research purposes.

Principal activities which are UNLAWFUL in the use of this area are listed below: Further information is available at Department of Natural Resources Offices.

- Collecting plants, animals, rocks or fossils.
- ° Camping, picnicking and swimming.
- ° Horses, dogs and other pets.
- ° Snowmobiles and other motorized vehicles.
- ° Hunting, trapping, fishing and boating.
- ° Entry into restricted areas and sanctuaries.

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MINNESOTA DEPARTMENT OF NATURAL RESOURCES



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PREFACE

Scientific and Natural Areas are established to protect and perpetuate natural features which possess exceptional scientific or educational value. Nominated areas must substantially satisfy a set of rigorously drawn criteria to qualify for designation. Scientific and Natural Areas serve many purposes. They are places for the quiet appreciation and study of nature. They serve as outdoor classrooms for teachers. They are areas against which the effectiveness of resources management techniques employed elsewhere can be evaluated. They also serve as control areas for scientists engaged in furthering our knowledge of natural processes.

However, acquisition alone does not assure long term preservation of natural areas and their endangered species. Many natural areas are declining in quality because they are not properly managed. Management of vegetation, control of foreign species, and management of visitors are important concerns.

Comprehensive planning is the key to effective and successful management. In 1975 the Minnesota legislature passed into law the Outdoor Recreation Act (86A), establishing the Outdoor Recreation System. This act directed managing agencies to prepare master plans for units of the system. This document is part of a planning effort to satisfy the mandates of that act. The goal of this plan is to coordinate a strategy for stewardship that addresses biological management, obligations of ownership, and visitor management.

This plan was prepared by the Department of Natural Resources, Scientific and Natural Areas Program with the assistance of the Commissioner's Advisory Committee on Scientific and Natural Areas. It was based on a resource inventory prepared by the Natural Heritage Program. Funding was provided by the Legislative Commission on Minnesota Resources.

SUMMARY OF MANAGEMENT PROGRAMS

General Management Considerations

Wild Indigo will receive a high level of management activity. Because an unusually large number of landowners adjoins this SNA, a strong public relations effort must be maintained. A local resident will be identified as a volunteer steward for Wild Indigo, and good communications will be established with adjoining neighbors. Some clean-up of debris will be required.

Structures and Facilities

Some culverts need cleaning, especially where the bulldozer caused damage. It is recommended that the entire SNA be eventually fenced. This will be done in segments based on priority and availability of funds. The old fence in several areas will be shorn up to provide temporary protection. A DNR unit trail will be developed on the former railbed to provide for hiking, skiing and limited bicycling. Parking will be allowed at each road intersection on the old railbed until the unit trail is developed. At this time parking areas and pull-offs will be constructed to avoid obstructing roadways and the unit trail. Two intersections will be developed to provide bus parking. The number and size of farm crossings will be kept at a minimum. A lease will be executed with adjacent landowners for these crossings. Additional signing needed on the SNAincludes rules and regulation signs, interpretive signs, and two entrance signs.

Vegetation Management

The SNA was divided into management units of approximately $\frac{1}{2}$ mile in length. These units are stratified into 5 management groups based on dominance or importance of vegetation type, and disturbance features. Vegetation management needs presently exceed management capacity. Prescribed burning will be the major management activity. It is expected that 3-4 miles can be burned per year. Areas requiring special consideration in a burn plan have been mapped.

Problem plants that are management concerns include: canada thistle (Cirsium arvense), bull thistle (Cirsium vulgare, white sweet slover (Melilotus alba), yellow sweet clover (Melilotus officionales) wild parsnip (Pastinaca sativa), smooth brome grass (Bromus inermis), bluegrass (Poa sp.), quackgrass (Agropyron repens) and reed canary grass (Phalaris arundinaceae). Noxious weeds are not a problem and the few isolated patches of Canada thistle and bull thistle are already being treated. Smooth brome grass and sweet clover will require special management attention. It is not clear what level of management is justified to control these species. The actual threat to the native plant community by these species will be studied. Mowing of the railbed and bulldozer scar will be done to suppress sweet clover.

Additional survey work is necessary for several rare plants, including: Indian plantain (Cacalia tuberosa), white lady's slipper (Cypripedium candidum), prairie white-fringed orchid (Habenaria leucophea). A few areas will be selected for rare plant censusing.

Agriculturally Related Problems

Field runoff results in siltation of low areas on the SNA and concentrates herbicides and fertilizers in these sites. The fenceline between the SNA and adjoining farmland is occasionally sprayed with herbicides, both by accident and intent. Local farmers, the county agricultural inspector, and professional herbicide applicators will be made aware of the SNA and its relationship to agricultural weeds. The SNA will be surveyed annually for herbicide damage and restitution sought for damages where appropriate. Several cases of encroachment have occurred along the right-of-way. The SNA will be surveyed annually for additional cases and reimbursement for damages will be sought.

Non-designated Right-Of-Way Parcels

There are three segments of the right-of-way that have not yet been designated as part of the SNA. The westernmost segment will be designated as SNA. The segment through Brownsdale will be retained for trail purposes and access. The non-designated segment through Dexter includes of three management units (31, 32, 33 respectively from west to east). Unit 31 will be evaluated as potential surplus land if access to front street is obtained. Unit 32 will be retained in state ownership because it harbors rare plants and prairie, and because it provides an important link in the Mower County grant-in-aid snowmobile trail system. The disposition unit 33 is undetermined. Further evaluation of the prairie's quality and composition in this unit is needed. • •

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OVERVIEW

Introduction

The Wild Indigo Scientific and Natural Area (SNA) is located in Mower County near the city of Austin. The SNA is part of the former railroad bed and right-of-way of the Chicago Milwaukee St. Paul and Pacific Railroad (CMSt.P & P). Approximately 100 miles of that right-of-way, between Ramsey and Hokah, was abandoned in 1979. The Department acquired two segments of this railroad. A 35 mile segment on the east end has become the Root River State Trail. Twelve and one-half miles between the Red Cedar River and Dexter is now the Wild Indigo SNA.

This railroad was one of the oldest in the state. The section that has become the Wild Indigo SNA was built in 1870. The right-of-way is 100 feet wide and consists of a railbed, shoulders, and adjoining prairie. The ties and rails were removed in 1980, leaving a 10-12 foot wide bare corridor down the middle of the right-of-way. The shoulders on either side of the railbed are 5-10 feet wide and are also disturbed. The remainder, between the shoulders and edge of the right-of-way, contains several rare plants and excellent remnants of a tall grass prairie community that once covered much of SE Minnesota.

Preservation Value

Wild Indigo SNA occurs within the Southern Oak Barrens landscape region. Unlike isolated prairie remnants, the 12¹/₂ mile long prairie corridor at Wild Indigo samples a wide range of environmental conditions originally present in the prairie region. Several highly significant natural features have been identified on the SNA by the DNR's Natural Heritage Program. The Natural Heritage Program maintains the most comprehensive data base available on Minnesota's rare plant and animal species, and biotic communities. These biological entities (species and communities) are known as "elements" and are ranked according to their endangerment in the state. One critically endangered plant community, 4 critically endangered plant species and 3 plant species of special concern occur on the Wild Indigo SNA.

Plant Communities

The Wild Indigo SNA is an excellent example of a plant community type called the (SE MN) Tallgrass Prairie. This plant community is ranked as threatened throughout its entire range and as critically endangered in Minnesota. Less than 500 acres of intact (SE MN) Tallgrass Prairie are known to exist.

The (SE MN) Tallgrass Prairie occurs on deep, fertile silt-loam soils and harbors upwards to 300 species of native plants, it is the most diverse prairie community type in Minnesota. The dominant grasses, big bluestem (Andropogon gerardi) and Indian grass (Sorghastrum nutans) reach heights of six to eight feet, due to favorable moisture and soil conditions. Broad-leaved plants restricted to, or modal to the (SE MN) Tallgrass Prairies include prairie wild indigo (Baptisia leucophaea), white false indigo (Baptisia leucantha), rattlesnake master (Eryngium yuccifolium), wild quinine (Parthenium integrifolium), and Indian plantain (Cacalia tuberosa).

Rare Plant Species*

Four plant species occurring on Wild Indigo SNA are threatened with extinction in Minnesota because of widespread destruction of prairie habitat. One of these is proposed as "endangered" and the other three as threatened. None of these are protected on SNAs anywhere else in the state. In addition, there are 3 species of "special concern" because they are declining throughout the state and may become threatened in the foreseeable future.

1. Wild Quinine (Parthenium integrifolium) -- State endangered species.

Wild quinine occurs only in Mower, Dodge, and Fillmore Counties. Since the time of settlement, the extent of its habitat has been reduced from more than 500,000 acres to less than 500. Of these, approximately 150 acres are protected at Wild Indigo SNA. The remaining 345 acres occur mainly on active railroad rights-of-way. These right-of-ways are unprotected and are likely to be abandoned and plowed within the next 10 years.

- 2. Indian Plantain (Cacalia tuberosa) -- State threatened species.
- 3. Valerian (Valeriana edulis) -- State threatened species.
- 4. Prairie milkweed (Asclepias sullivantii) -- State threatened species.

Indian plantain, valerian and prairie milkweed have suffered a fate similar to wild quinine. They flourished in southern Minnesota priaires before man arrived, but were subsequently decimated by the plowing of the prairies. Because these three species were originally more widespread in Minnesota, they are not as near state extinction as wild quinine and are given the status of "threatened." However, if the current rate of habitat destruction continues, they will become critically endangered within the next ten years because, like wild quinine, they are not currently protected on SNAs anywhere in the state except Wild Indigo SNA.

- 5. Rattlesnake master (Eryngium yuccifolium) -- special concern species.
- 6. Wild indigo (Baptisia leucophea) -- special concern species.
- 7. White lady's-slipper (Cypripedium candidum)--special concern species.

*"Rare" in this report is defined as a species proposed as endangered, threatened or special concern in: Endangered and Threatened Plant species of Minnesota. Recommendations of the Endangered Species Technical Advisory Committee, presented to the Commissioner of the DNR, Nov. 1982.

ORA Classification

The Wild Indigo SNA fully meets the designation criteria for a scientific and natural area as outlined in the Outdoor Recreation Act of 1975 (86A.05 Subd. 5). The preserve includes: (1) natural features which significantly illustrate an undisturbed plant community; (2) habitat supporting the following rare, endangered or restricted plants: wild quinine (Parthenium integrifolium), valerian (Valeriana edulis), Indian plantain (Cacalia tuberosa), prairie milkweed (Asclepias sullivantii), prairie wild indigo (Baptisia leucophaea), rattlesnake master (Eryngium yuccifolium), and white lady slipper (Cyprepidium candidum), and (3) an area large enough to permit effective research and educational functions and to preserve the inherent natural values of the site.

Management Philosophy

The two most important attributes of Wild Indigo SNA are (1) the high natural quality and diversity of the plant community, and (2) the presence of several rare species. The major management problems are controlling woody encroachment and exotic herbaceous plants, stagnation of native species due to cessation of fire, and the impacts of adjacent agricultural activity. The increasing magnitude of these problems and inherent dynamic nature of a prairie community necessitates an <u>active</u> management policy for this SNA.

I. GENERAL MANAGEMENT CONSIDERATIONS

A. Level of Management Activity

The amount of management that takes place in an SNA is dependent on need and practicality of implementation. The level of management activity at Wild Indigo SNA will be <u>high</u>. Some of the geographical considerations are discussed below.

a. Distance from St. Paul and regional officers.

Wild Indigo SNA is approximately 100 miles from the St. Paul based SNA staff. Day trips are possible but do not allow for much time in the field. Wild Indigo SNA is about 40 miles from DNR regional offices in Rochester. Because of this proximity, a considerable amount of management will be coordinated out of the Rochester office through the Area Wildlife Manager.

b. Proximity to university or college campuses and research facilities.

Wild Indigo SNA is not particularly close to any major educational institutions (Mankato State Univ.--75m., Winona State Univ.--80 mi., Univ. of Minnesota Twin Cities--100 mi.). There are community colleges in Austin and Rochester. The University of Minnesota Hormel Institute is also locted in Austin. This research facility is reknown for its work with lipids. Students wishing to do technical chemical research on Wild Indigo SNA may be able to coordinate some of their activities with this facility.

c. Proximity to other SNAs.

Racine SNA is a $\frac{1}{2}$ mile railroad right-of-way approximately 15 miles east of Wild Indigo SNA. Some coordination of management effort may be possible between these two units.

B. Surveillance and Enforcement

Nonconforming uses can damage natural conditions and the aesthetic appearance of natural areas. Because of the value and fragility of nature preserves, their continuing protection and maintenance should be provided on a systematic, rather than haphazard basis. Wild Indigo SNA is particularly susceptible to nonconforming uses because of its long narrow configuration. This unit, though small in acreage (155 ac.), has 28 miles of boundary. A square unit of the same size would only have about 2 miles of boundary. Help in protecting Wild Indigo's resources can be accomplished by developing local support and understanding of the SNA. Local citizens are encouraged to report any signs of problems or nonconforming uses. A local volunteer should be assigned responsibility for scheduled field inspections, answering questions as they arise locally, and preparing an annual status report. Enforcement is the responsibility of the local conservation officer and the SNA staff. The Area Wildlife Manager in Rochester is the local DNR contact for this SNA.

Action # 1	Periodically release informational articles on Wild Indigo SNA in the local newspapers.
Action # 2	Periodically send information announcements on Wild Indigo SNA to adjacent landowners.
Action # 3	Identify a local person to be an SNA volunteer steward.
Action # 4	Develop a good line of communication with adjacent landowners.

Considerations:

Contacts - Because of the extreme length of this SNA, good communication must be established and maintained with several neighbors along the right-of-way. The SNA Program should have one good contact with an adjacent landowner per mile (section).

C. Cleanup

A fair amount of trash needs to be removed. This includes:

- a. rolls of snow fencing
- b. metal debris left from tie and rail removal
- c. old railroad ties
- d. miscellaneous trash

The location of a, c, and d are identified on the land-use history maps in the resource inventory. Metal debris (b) is scattered along the length of the right-of-way.

Action # 5 Clean up trash on the right-of-way.

Considerations:

Preburn cleanup - a, c, and d from above

Postburn cleanup - d, especially metal debris, would be easily collected following a burn.

II. STRUCTURES AND FACILITIES

A. Culverts

Many culverts cross the right-of-way which on occasion may require cleaning. Proper cleaning will include removal of the dirt and debris off the SNA. Those culverts in greatest need presently occur in the westernmost 7 miles of the SNA. Here the bulldozer, grading the access road for tie and rail removal, damaged or partially filled several culvert outlets on the south side of the right-of-way. On the rest of the right-of-way only 2 culverts need cleaning. It is not expected that any culverts will need replacement in the foreseeable future.

Action #6 Clean culverts.

Considerations:

Methods - Hand cleaning is all that will be required. No heavy equipment or vehicles are allowed off the railbed.

Areas - 12 culverts need cleaning, 9 west and 3 east of Brownsdale. Specific locations are on file with the SNA Program.

Frequency - Routine cleaning is not necessary. They should be checked every 3 years and cleaned as necessary.

B. Fencing

There have been several instances of encroachment, trespass by motorized vehicles, and dumping of field rock, tiling debris and other miscellaneous trash along the right-of-way. The only long term solution is to erect a permanent, physical barrier. Much of the right-of-way is partially protected by fencing originally erected and maintained by the railroad. This fence, however, is seriously delapidated along most of its length. A simple cable gate exists across the railbed on either side of each road crossing. These gates are not connected to the side fencing. The long term objective is to replace the entire fence. The expense of such a project is staggering. New fencing will be erected in a segment by segment manner based on a priority system. (see map A)

Action #7 Erect a 3-strand barbed wire fence (see map A).

Considerations:

Priority ranking - 1) Segments containing good or high

quality prairie with no existing fencing

- Gate road crossings to close off good or high quality prairie
- 3) Segments containing good or high quality prairie with poor fence

4) the rest

Special requests - Requests by adjoining landowners for joint fencing will be given a priority ranking based on need (i.e., fencing pastureland) and considered with other fencing needs.

Construction - 3-strand barbed wire will be adequate for most situations. The lowest strand should be strung relatively high (e.g. 2 ft.) to minimize any possible heat damage from prescribed fires.

Road crossings - Fencing at road crossings will be in line with road right-of-ways and include existing gates (see Access). Some existing gates may require moving to line up with the fence. Where possible, parking space for two cars should be provided (35-40')

Action #8 Shore up existing fencing where practical.

Considerations:

Shoring - Some existing fencing can be shorn up to provide a more effective barrier until permanent fencing is possible.

C. Trail*

The issue of developing a recreational trail within the SNA was addressed in legislation allowing acquisition of the right-of-way, and it was the subject of a public hearing held in Austin December 7, 1982. In response to that hearing the Findings and Order of the Commissioner states:

"The DNR will establish a unit trail throughout the length of the SNA which will provide limited bicycling opportunities, as well as opportunities for hiking and skiing. It will be developed using in-place materials to a maximum width of six feet for the approximate twelve miles of the SNA."

*A copy of the legislation allowing acquisition (85.015, subd.7), "Report of the hearing examiner (DNR-83-003-HK) and the "Findings and Order of the Commissioner" are available on request.

A DNR unit trail provides day use opportunities that are consistent with the purposes for which the DNR unit has been established.

Action #9 Develop a trail on the former railbed.

Considerations:

- Development Project specifications must be concisely written to assure protection of the SNA resources, including:
 - -Confinement of construction vehicles to the railbed and field crossings.
 - -Specifications regarding movement and placement of surface materials.
 - -Monitoring of construction activities to assure compliance.
- Bicycling The unit trail will be maintained to provide limited bicycling opportunities. Suitability of the trail surface for this use will be judged following an adequate trial period, and modified if necessary and appropriate.

D. Access

Access to the east end of the proposed SNA unit trail is presently from the middle of Dexter, where the right-of-way intersects Main Street. From here to the west edge of Dexter the right-of-way parallels Front Street. It is separated from Front St. by a 50 foot strip of land. There is a mixture of commercial development along this 1/2 mile, particularly near Main St.

Action #10 Obtain access to the SNA from Front St. near the west edge of Dexter.

Considerations:

Justification - Terminating (beginning) the trail at the west end of Dexter will avoid conflicts between commercial activities and trail users.

E. Parking

There are 13 roads that cross the SNA, one almost every mile. Presently one or two cars can be parked end to end on the former railbed, either side of the road. They are prevented by a gate from driving any further (See Fencing, Action 7). This provides parking for 2-4 vehicles at each intersection. When the trail is developed, vehicles will no longer be allowed to park on the railbed. New parking space should be provided at that time. Special accommodation will be provided for buses.

Action #11 Construct parking areas when unit trail is developed.

Considerations:

Location - Parking areas to accommodate SNA users will be necessary in Brownsdale, Dexter and on Hwy 61. Pull-off space sufficient to accommodate 1-2 cars is anticipated at most other intersections to avoid obstructing public roadways and the unit trail. No parking will be developed in the "triangle" (NE corner Sec 16 T103 R16)

Future Considerations - If the Austin Lineal Park System trail can be connected to the SNA, parking may be provided as part of the municipal effort. Another potential would be to develop a trail head and parking lot cooperatively with Izaak Walton League on their property adjacent to the SNA along the Red Cedar River.

User Orientation - Informational mateials (i.e. signs) to orient visitors to the SNA and the unit trail will be provided at major parking areas.

Action #12 Provide two areas for bus parking (see map A)

Considerations:

Siting - Both of these areas provide good access to areas with good quality prairie.

a) CSAH 16, west of Brownsdale, bituminous surfaced roadb) CSAH 19, east of Brownsdale, gravel road, 25' wide roadway

Specifications - a) 50 feet pull-in distance b) One pull-in per intersection

Action #13 Eliminate parking in the "triangle" (NW corner of section 16, T103N R17W).

Considerations:

Gates - Existing gates need to be moved towards the road to discourage parking. The "triangle" is too small to accommodate parking and there is adequate space outside it.

E. Farm Crossings

Crossings are necessary for farming operations, however to fulfill SNA management objectives the number and size of crossings must be kept at a minimum.Farm implement crossings are sites of continuing disturbance. Noxious weeds and nuisance plants occur in these areas, confounding management efforts to suppress these species on the rest of the right-of-way. Presently, there are 22 active field crossings and 3 inactive ones.

Action #14 Execute leases with adjacent landowners for farm crossings.

Considerations:

Need - Crossings will only be allowed where reasonable need is demonstrated, and where there is no other practical access.

Containment - Farm crossings will be no wider than $16\frac{1}{2}$ '. They will be defined by an opening in the fence or by posts 25' apart; both on the north and south boundaries of the SNA.

F. Signs

The purposes of signing are to 1) identify the area, and 2) provide basic visitor information. Four types of signs will be used. Boundary signs have already been posted along the entire length of the SNA. In addition, rules and regulations signs, entrance signs, and interpretive signs will be necessary.

Action #15 Post rules and regulation signs. (see map A)

Considerations:

Location - One sign per intersection, and at access points on the west edge of Brownsdale and Dester.

Action #16 Post two entrance signs.

Considerations:

Location - One at the intersection of County Road 16, and one at the intersection of County Road 20. Both of these are bituminous surfaced roadways and provide the best locations for high visibility.

Style - Wood routed sign, visible to both directions of traffic.

Action #17 Erect interpretive signs.

Considerations:

Location - One per intersection

Content - Overview of the entire SNA and an explanation of its significance.

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III. VEGETATION MANAGEMENT

A. Management Units

The SNA was divided into management units of approximately $\frac{1}{2}$ mile in length. Where there are physical boundaries to management or abruptly different management requirements, the units were adjusted appropriately. (see map B) The units were stratified into 5 management groups based on dominance or importance of vegetation type and disturbance features. (See the resource inventory for a description of the vegetation types.)

- Group I (4 units) Management determined by the presence of vegetation type A. Vegetation type A is the highest quality prairie occurring on the SNA and contains an abundance of conservative and rare species. Because of this high quality, management prescriptions for these management units should be conservative.
- Group II (5 units) Management determined by the vegetation type B. B's contain almost the full complement of rare and conservative species in addition to disturbance related management problems. This management group provides the best opportunities to examine effects of different management methods on: rare species, competition between native and exotic species, community diversity etc. These will be the learning grounds for managing Group I units. Management prescriptions should be <u>experimental</u> and be accompanied by appropriate monitoring and evaluation methods. It is likely that with effective management, B vegetation types can be restored to A, and the management unit would ultimately be included in Group I.
- Group III (15 units) Management is determined by the dominance of III' vegetation types C and D. It is uncertain to what degree these units can be restored to a better condition with fire alone, especially in regards to the rare and conservative species. Best chances for success are probably with those units containing some B vegetation type (III' units). The short term management goals for this group are to enable aggressive native species achieve dominance and suppress exotic species. Management prescriptions will be <u>conventional</u>. A realistic long term goal will need to await the preliminary results of burning.
- Group IV (4 units) Management determined by the dominance of vegetation types SD and/or RC. These units are dominated by non-native, sod-forming grasses such as smooth brome, quack and reed canary grass. The restoration of these units to a native dominated community would require extensive manipulation. Management will be <u>deferred</u> until the other management objectives are met. Management

prior to that time could be allowed if a convenient occasion arose and other management goals would not be affected.

Group V (5 units) This management group is a collection of units where appropriate management is not yet determined or expected. It includes units within towns, wooded vegetation types and undesignated units whose use is not yet determined. In regards to management this is a future study group.

B. Prelimnary Management Recommendations

- Group I Dormant season fire to remove accumulate thatch, approximately 1 burn per 3-4 years. Group I units should be brought under management one at a time. Initially, no two units should be burned at the same time and preferably not in the same year.
- Group II Experiment with a variety of burn frequencies, timings and intensities.
- Group III, Successive, late spring burns to suppress non-native, cool III' season exotics and stimulate warm season natives.

Group IV As time permits

It is anticipated that 3 miles of right-of-way (16 management units) can be burned per year. Until this management capacity is increased, only a portion of the SNA can be brought under management. Initial vegetation management efforts should be targeted to Group I and II management units.

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C. Fire Protection and Management

Prescribed burning will be a major management activity. Several areas will require special preparation to assure containment of the fire within the SNA (see map C). Agricultural crops, primarily soybeans and corn, are planted up to the edge of the right-of-way. In the spring and early summer these plowed fields provide an excellent firebreak. In the fall, however, there is the possibility that fire might escape into the crops. Fall weather is also less dependable for burning than spring. Together, the weather and crops in the field make fall burning less predictable than spring burning.

The Dexter and Brownsdale volunteers fire departments would be called upon to control wildfires that might occur on the SNA.

Action #18 Contact the Dexter and Brownsdale fire departments.

Considerations:

Desirable control methods - Discuss with the fire departments the purpose of Wild Indigo SNA and desirable methods of containing a wildfire. Provide them with a fire management map.

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Action #19 Initiate a fire management program. Burn approximately 3 miles/yr (see also, Preliminary Management Recommendations).

Considerations:

Boundary considerations - a) low areas (see map C) b) crops in the fall

Firebreaks - Minimize firebreak construction. Firebreaks would introduce additional disturbance in a precariously narrow corridor. Motorized vehicles (i.e., tractors) are not permitted on the prairie, so fire break construction must be done by hard or with power assisted hand mowers. This is very labor intensive.

Trail Users - Appropriate safety measures will be taken to keep trail users away during a burn.

F. Problem Plant Management

The following plant species are potential management concerns on this SNA.

Noxious Weeds:

<u>Cirsium</u> arvense, Canada thistle - a few scattered patches, mostly along the railbed shoulders

Cirsium vulgare, Bull thistle - a few patches in the bulldozer scar

Biennials:

Melitotus alba, White sweetclover - common to locally abundant on the railbed, shoulder and bulldozer scar.

Melitotus officionales, Yellow sweetclover - same as above

Pastinaca sativa, Wild parsnip - scattered to locally common on shoulder, bulldozer scar and a few low wet areas.

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Perennial Sod-forming Grasses:

Bromus inermis, Smooth brome - common on shoulder and along fence lines, occasionally dominant across entire width with and without native species.

<u>Poa</u> sp., Bluegrass - ubiquitous in both disturbed and undisturbed areas.

<u>Agropyron</u> <u>repens</u>, Quack grass - abundant on shoulder and other sites of recent disturbance.

<u>Phalaris</u> arundinaceae, Reed canary grass - dominates several wet areas

The objectives of problem plant management are 1) to arrest the expansion of these non-native species, 2) to identify the real threats of non-native to native species, 3) to stimulate the establishment and growth of native species in disturbed areas, and 4) identify factors limiting the establishment and dominance of native species in disturbed areas.

The SNA was surveyed by the county agricultural inspector in 1982. Noxious weeds were not a problem. The few isolated patches are already being treated.

Management of the other problem plants has already been considered in the stratification of management units into management groups and the prescriptions for those groups. Three of these problem species, smooth brome, and both sweetclovers will require additional management. Some research attention should also be directed towards reed canary grass.

## SMOOTH BROME

## Present Status

Smooth brome dominates many stretches of shoulder and fence rows, often in monotypic patces. Also occurs occasionally mixed with conservative prairie species. In these cases it is suspected of having moved off the shoulder onto the prairie (without the aid of any disturbances) and displacing many native species.

### Threat

Brome occurs on railbed shoulders through good and high quality prairie areas. Where it is capable of displacing native species, areas with brome could threaten the integrity of that adjacent prairie.

## Control Capability

Mowing: The objective would be to cut flowering culms before fruiting. Even under the best conditions this is not expected to be an efficient control method. Brome has an excellent capacity for vegetative regeneration.

Burning: A late spring burn would have the greatest effect in suppressing brome. In monotypic stands it is not certain whether this would result in a shift to other species.

Herbicides: Careful, selective application of a herbicide could effectively control a monotypic stand. Herbicide use might be coupled with burning to stimulate the establishment of other species. Herbicide use is not acceptable in an area with both natives and brome mixed.

Action #20 Keep quantitative and qualitative records of smooth brome in managed and unmanaged areas.

Considerations:

Permanent plots - Establish permanent plots and mark boundaries of brome stands. Note change over time.

Qualitative observations - Record the relative status of brome in relation to native species prior to each vegetation management treatment (% coverage, interspersion, etc)

Action #21 Initiate a small scale research project investigating the use of herbicides to suppress brome in monotypic stands and allow recolonization by native species.

Considerations:

Suitable sites - This research should not be conducted in management group I or II units.

SWEET CLOVER\*

## Present Status

Well established on railbed, shoulders and bulldozer scar as a result of disturbance caused by tie and rail removal in 1980. On the railbed, sweet clover has little competition. On the shoulders it grows with perennial grasses such as bluegrass, quackgrass, and smooth brome. As these grasses become better established, they greatly reduce sweet clover establishment.

\*Additional information on sweet clover management provided in Appendix .

### Threat

Sweet clover can compete with native plants for light, nutrients, water, and space. At the seedling or early vegetative stages sweet clover is not a good competitor. Second year plants grow rapidly in spring and can compete with other plants. Hard seeds lie dormant for many years in the soil, perpetuating the population. Preliminary results from a study of soil seed samples suggest that sweet clover seed is primarily restricted to disturbed areas. Sweet clover does not persist well in a perennial sward. It is not certain to what degree sweet clover stresses established native species or affects recolonization fo disturbed areas by native plants. Sweet clover does fix nitrogen and may improve the fertility of the soil (i.e., the railbed). The type of threat can be categorized by location:

- a) Bulldozer scar Sweet clover may inhibit recolonization by native species through direct competition.
- b) Railbed Sweet clover contributes to the soil seed bank.
- c) Shoulders Sweet clover contributes to the soil seed bank.

## Control Capability

Mowing: Effect is dependent on location.

- a) Bulldozer scar The ground is rough. Minimum cutting height is approximately 6". Resprouting occurs after mowing. Some improvement is possible with different equipment and timing. Cutting may cause some damage to native plants also.
- b) Railbed The ground is level. Cutting height with proper equipment will cut below the lowest branch axils. Some resprouting from root crowns occurs. No conflict with native species.
- c) Shoulder Difficult or impossible to mow. Steep slopes and/or berms.

Burning: Effect is dependent on location.

- a) Bulldozer scar Fuels are sparse in some areas, will mprove over time.
- b) Railbed insufficient fuel.
- c) Shoulders Fuels generally adequate, ground is rough, especially in bermed areas. Unevenness may result in a patchy burn.

Herbicides: Sweet clover does not grow in monotypic stands, hence spraying is not acceptable. Wick application may be effective since 2nd year sweet clover overtops the other vegetation. Action #22 Mow the railbed and bulldozer scar at least once, preferably twice per growing season (see Action 18 for exceptions).

## Considerations:

Records - Make observations on the phenologic state and perenniation of the sweet clover, and the coverage within each management unit prior to treatment.

Unit Trail - Mowing strategies on railbed will be modified when the unit trail is constructed.

Action #22 Initiate a research project to investigate whether mowing for sweet clover is justifiable.

## Considerations:

No-mow areas - Identify management units that will be excluded from mowing or only partially mowed. Monitor the relationship between native species and sweet clover growth in unmowed, mowed and mowed/burned units. This should contain a representative sample of railbed, bulldozer scar and shoulder situations.

Soil seed bank - Monitor the soil seed bank for sweet clover in mowed and unmowed units.

## REED CANARY GRASS

### Present Status

Reed canary grass dominates several low wet areas and occurs as scattered clumps in several others.

## Threat

Reed canary grass forms a dense monotypic sod. It is uncertain whether this grass is displacing native lowland prairie or simply represents an area of past disturbance.

## Control Capability

Mowing: Not feasible because of wetness.

Burning: Not expected to alter existing conditions but may retard further expansion. Herbicides: Unknown. Action #23 Establish a few study areas to monitor displacement of native lowland prairie by reed canary.

Considerations:

Sites - Management unit #17

Action #25 Prior to each management, treatment record phenologic condition and describe abundance and distribution of reed canary within the unit.

## G. Rare Plant Management

The conservation of threatened, endangered, and special concern species is a primary management objective for SNAs. Monitoring studies that contribute towards a complete understanding of the biology of rare species are the basis for conservation management. Successful management of a rare plant popultion implies the ability to manipulate the size and structure of that population. If monitoring is to contribute significantly to this ability, it must yield predictive understanding of population structure and functioning.

As a minimum, censusing of those species with the highest conservation priority is necessary on Wild Indigo SNA. The objective would be to document numbers of individuals in a population over time. This might provide guidance for future management decisions and practices.

Major deficiencies in a censusing approach are a) one is monitoring the end result without knowing precisely how it was arrived at, and b) generally only one phenological stage is considered. Both of these difficulties may be overcome by intensive monitoring that studies autecological information on life history, phenology, population flux, survivorship and the causes of mortality. This level of information is highly desirable but the likelihood of obtaining it is remote.

| Action #26 | Survey the  | entire SNA f       | for: <u>Cacalia</u> | tuberosa, | Cyprepidium |
|------------|-------------|--------------------|---------------------|-----------|-------------|
|            | candidum an | d <u>Habenaria</u> | leucophea.          |           |             |

Action #27 Census a few select areas for: <u>Asclepias sullivantii</u>, <u>Partenium integrifolium</u>, <u>Cacalia tuberosa</u>, <u>Valeriana</u> edulis and <u>Cypripedium calceolus</u>.

Considerations:

Location - Site A: Management Unit #26; Sec 16, T103N R16W Site B: ?

| Action #28 | Prior to any management activity on a unit, record |
|------------|----------------------------------------------------|
|            | phenologic condition and estimate abundance and    |
|            | distribution of rare plants within the unit.       |

### IV. AGRICULTURALLY RELATED PROBLEMS

## A. Field Runoff

Fall plowing is the most common tillage method along the right-of-way. Herbicides and fertilizers are typically applied in the spring. A combination of spring snowmelt, heavy spring rains, and bare fields causes siltation of low areas on the SNA, concentrating herbicides and fertilizers in these sites.

Siltation: Silt smothers established vegetation and perpetuates dominance by disturbance species.

Herbicides and fertilizers: Those soluble in water or adhering to soil particles concentrate in low areas. Preemergent herbicides are the most widely used.

Management alternatives: ?

## B. Field Edge Spraying

The border between the SNA and adjacent fields is occasionally sprayed by farmers with herbicides. This is done either intentionally, or unintentionally when a spray rig turns at the edge of a field. In the latter case a characteristic scalloping of disturbance species is evident along the edge.

Native prairie vegetation smothers out agricultural weeds. Herbicide

spraying kills the native vegetation and allows the agricultural weeds to grow. Continued spraying may kill existing "weeds", but it perpetuates the disturbed conditions and actually assures their continued presence. In addition, some native plants are being mistaken for weeds. <u>No</u> native prairie plants are agricultural weeds.

| Action #29 | Continue educational efforts with a) County Inspector, b)  |
|------------|------------------------------------------------------------|
|            | local farmers and c) professional herbicide applicators to |
|            | make them aware of the SNA and its relationship to         |
|            | agricultural weeds.                                        |

Action #30 Annually survey for herbicide damage.

## Considerations:

Restitution - Pursue restitution for any damages to the SNA from herbicides.

## C. Encroachment

There have recently been several cases of encroachment. This included plowing of the SNA, use of the right-of-way as a field road, and dumping. Damages caused by encroachments are irreparable. Periodic incidences like these are probably responsible for many of the areas dominated today by disturbance vegetation. The only solution that provides long-term protection is fencing (see fencing, Action 7). Now that the resources are well documented, compensation for damages caused by future encroachments will be sought.

Action #31 Annually survey the SNA for encroachments. (Coordinate with Field Edge Spraying, Action 24.)

## V. ADDITIONAL INVENTORY NEEDS

No systematic inventory of Wild Indigo's faunal groups has been conducted. The narrowness of the habitat, and relatively large proportion of edge accentuates influences of surrounding land use on the SNA's animal community. Population dynamics are influenced primarily by circumstances occurring outside the SNA.

Action #32 Systematically survey the fauna of Wild Indigo SNA.

Considerations:

Priorities - Small mammals and insects should receive the highest priority for survey work.

## VI. NON-DESIGNATED RIGHT-OF-WAY PARCELS

Three segments of the right-of-way have not yet been designated as part of the SNA. From west to east these are:

- a) Management Units 1 & 2 (NW<sup>1</sup>/<sub>4</sub> Sec 23, T103N R18W)
- b) Management Unit 13 (through Brownsdale)
- c) Management Units 31,32,33 (west end of Dexter to east end of ownership)

The "Findings and Order of the Commissioner" concerning the Report of the Hearing Examiner (DNR-FS-003-HK) states: "...connecting links suitable for trail use will be designated as part of the Wild Indigo SNA... This will allow trail use along a continuous linear corridor from the Red Cedar River to Dexter." The proposed use and disposition of each segment is discussed below.

Action #33 Designate Management Units 1 and 2 as SNA.

Considerations:

Justification - These contain native prairie and woodlands and also provide access to the Red Cedar River.

Action #34 Retain Management Unit 13 for trail purposes.

### Considerations:

Justification - This unit provides a critical link for the unit trail and access to Management Unit #12.

Special Considerations - This unit does not contain SNA quality resources. Leases for use of this land may be considered as long as trail use of the corridor is assured (approx. 30' wide).

Action #35 Evaluate Management Unit 31 as potential surplus land, providing that access from Front Street to the SNA is obtained (see Action 11).

## Considerations:

Justification - This unit goes between commercial properties and has no SNA quality resources.

Special Considerations - Access to Front Street should provide off-street parking for 3-4 vehicles.

Action #36 Retain Management Unit 32 in state ownership (including the I-90 bridge).

## Considerations:

Justification - Provides an important link in the Mower County grant-in-aid snowmobile trail system and also contains rare plants.

Special Considerations - Woody encroachment threatens the rare plants in this unit. It will require a sustained, intensive management effort to set back and control woody growth. If such management does not prove feasible prairie plants in this unit may be considered for experimental or salvage uses.

Action #37 Assess the quality of Management Unit 33.

## Considerations:

Justification - This unit is physically separated from the rest of the SNA. It has had a fair amount of disturbance, including agricultural encroachment on the south side, but also contains some prairie and rare plants. It does not serve any trail functions.

Special Considerations - This unit should be burned to assess the quality and composition of the prairie before its disposition is decided.

### VII. EFFECTS OF MANAGEMENT ON SIGNIFICANT RESOURCES

### General Actions

- Fencing: Highest priority for fencing was given to those areas with the highest quality prairie. These areas contain a majority of the rare plant populations; hence, they will receive the earliest protection.
- Management Units: Group I units contain a large proportion of rare plants and will be managed conservatively to assure their protection. Group II units also contain a sizeable number of rare plants. A variety of management approaches will be implemented on these units specifically to determine their effects on rare plants. Group III units do not have many rare plants and management is primarily directed at reducing non-native species populations.
- Primary Target Areas: These areas encompass the highest quality prairie segment (with their associated rare plants) and will be given priority for management activity.
- Problem Plant Management: Because these rare species generally do not occur in disturbed areas they will not be directly impacted by problem plant management. One possible exception is controlling smooth brome grass. This issue has been recommended for study (Brome, Action 15, 16).

Wild Quinine (Parthenium integrifolium) Indian Plantain (Cacalia tuberosa) Rattlesnake Master (Eryngium yuccifolium)

> Burning (Action #15): These 3 species are all summer blooming, perennial forbs. Burning, especially in spring is expected to benefit the plants.

Prairie Milkweed (Asclepias sullivantii)

- 1. Agricultually related problems: Prairie milkweed occurs scattered as one or a few individuals associated with low wet ground. These areas are potentially subject to field runoff, herbicide drift, and "drying out" by adjacent field tiling.
- 2. Burning (Action #15): Burning is anticipated to benefit this species.

## Valerian (Valeriana edulis)

1. Burning (Action #15): <u>V. edulis</u> is at its maximum rate of growth and flowering in late April and May. Removal of thatch by the burn is expected to stimulte the growth of this species. Successive burns during this period may result in a decrease in plant vigor and survival. White Lady's Slipper (Cypripedium candidum) Wild Indigo (Baptisia leucophea)

> 1. Burning (Action #15): Wild indigo and white lady's slipper are at their greatest growth rate and flowering in May and June. Late spring burning may be directly damaging to these plants, however, burning in general is expected to invigorate growth and flowering.

### MANAGEMENT COSTS AND IMPLEMENTATION

Actions recommended in this plan have been separated into two categories: 1) administrative and 2) operational. The costs of administrative actions are difficult to itemize because they are included in an SNA staff member's salary. Collectively, increases in administrative responsibility recommended in this and other plans will exceed existing staff capacity. Adequate staffing must be provided to implement these plans as recommended.

Operational actions are on-site activities. These often have both capital and labor costs. Capital costs have been listed. Estimates of labor needs are provided where possible.

Administrative and operational actions are often funded out of different sources. This makes it difficult to present an implementation schedule that equates both types of actions. To accommodate budget planning, separate implementation schedules are outlined for each category.

It is important, however, to have a mechanism that does allows comparison between all actions in this plan, and between actions from different plans. The system outlined below distinguishes between a) actions needed to improve or maintain the integrity of a site's most important features, b) legal or moral obligations of ownership or land management by SNA, and c) all other actions important for reasons other than above.

Stewardship Group I Actions: These are actions that prevent or reduce the vulnerability of the element to destruction or serious degredation. That is, in the absence of these actions the preservation of the element is threatened on this site. Research, ecological survey and monitoring may be included here if, without such information, it is not known what actions are necessary to maintain the element.

Stewardship Group Ia Actions: These actions are the same as Group I except that they are actions needed by all or the majority of elements on the site.

Stewardship Group II Actions: Actions necessary because they constitute an obligation of land management/ownership by the SNA Program. In some cases, actions may qualify under both Group I and II. For instance, a plant listed on a state noxious weed law may grow on a preserve. Control of the plant may be necessary as an obligation of ownership. If no action is taken, the county agricultural inspector might go in and broadcast spray to control the weed, and this could seriously impact elements on the preserve. In this case, the action to control the weed to avoid the broadcast spraying should be listed under Group I actions. If the weed grew in a road ditch and whatever action taken to control it was unrelated to element protection, weed control would be included under Group II actions. Other examples of actions usually included here are maintenance of road shoulders and litter removal.

Stewardship Group III Actions: Actions taken for all other reasons. Once again, care should be taken to 'float' actions up to the highest group justified. In many cases, activities such as guided field trips will fall under Group III. If it can be truly said that in the absence of such education activities vandalism or other acts would ensue which would negatively impact element preservation, these stewardship actions could be listed under Group I. Such arguments should be well supported with background information. In general, actions taken to improve aesthetics, promote or enhance public use, develop trails, derive income and develop facilities will fall under Group III.

The following chart illustrates the scheduling of actions described in the text, and the immediate and on-going capital costs of implementation. The scope of this plan covers a ten year period. The plan should be reviewed every five years to evaluate progress, reassess priorities and refine management techniques. Actions listed under the category "Begin Immediately" need immediate attention. "Phase I" is the first five year period. "Phase II" is the second five year period. Implementation of many actions is dependent on availability of materials, equipment and labor. An action may be initiated sconer than scheduled if circumstances so dictate and earlier scheduled actions will not suffer as a result.

## ADMINISTRATIVE ACTIONS

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Steward- |                      |         |          |                           |
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| ) - d d a m  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ship     | Begin<br>Immodiatela | Dhaga I |          | Commonts                  |
| Action       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Group    | Immediately          | Phase 1 | Phase II | Comments                  |
| Action #18.  | Contact Brownsdale and Dexter fire departments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Ia       | X                    |         |          | Update them periodically. |
| Action #14.  | Lease farm crossings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | II       |                      | Х       |          |                           |
| Action #33.  | Designate Management Units 1 and 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | II       |                      | Х       |          |                           |
| Action #34.  | Retain Management Unit 13 for trail purposes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | II       |                      | X       |          |                           |
| Action #35.  | Evaluate Management Unit 31 as potential<br>surplus land.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | II       |                      | X       |          | Contingetn on Action 10   |
| Action #36.  | Retain Management Unit 32.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | II       |                      | X       |          |                           |
| Action #37.  | Assess the quality of Management Unit 33.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | II       |                      | X       |          |                           |
| Action # 1.  | Release informational articles in local paper.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | III      |                      | X       |          | On-going                  |
| Action # 2.  | Send information announcements to<br>adjacent landowners                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | III      |                      | X       |          | On-going                  |
| Action # 3.  | Identify volunteer steward.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | III      | Х                    |         |          | Maintain annual contact.  |
| Action # 4.  | Develop good communications with adjacent landowners.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | III      |                      | X       |          | On-going                  |
| Action #29.  | Continue weed education efforts with local<br>farmers, professional herbicide applicators<br>and the county agricultural inspector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | III      |                      | X       |          | On-going                  |
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|                                                                                                      | ship<br>Group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Begin<br>Immediately                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Phase I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Phase II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Erect fence.                                                                                         | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | \$140,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Will be done segments as funds<br>become available.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Shore up existing fencing.                                                                           | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | May be included with action #7 bid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Initiate fire management program.                                                                    | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nc (no cost)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -On-going<br>-Burns carried out by DNR staff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Keep a) quantitative and b) qualitative<br>records on smooth brome grass                             | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nc (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | On-going                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Initiate herbicide research project on smooth<br>brome                                               | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 100/yr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -On-going<br>-Cost of herbicide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mow railbed and bulldozer scar 1-2 times per<br>year                                                 | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | \$1000-\$2000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -On-going                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Initiate research project on sweetclover                                                             | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (qualitative<br>observation)<br>nc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (quantitative<br>study)<br>nc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | On-going                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Establish study project on reed canary grass                                                         | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | \$50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -Materials                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Record observations on reed canary grass prior to each management treatment.                         | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | On-going                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Survey for <u>Cacalia tuberosa</u> , <u>Cypripedium</u><br>candidum and <u>Habenaria leucophea</u> . | Ia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                      | Erect fence.<br>Shore up existing fencing.<br>Initiate fire management program.<br>Keep a) quantitative and b) qualitative<br>records on smooth brome grass<br>Initiate herbicide research project on smooth<br>brome<br>Mow railbed and bulldozer scar 1-2 times per<br>year<br>Initiate research project on sweetclover<br>Establish study project on reed canary grass<br>Record observations on reed canary grass prior<br>to each management treatment.<br>Survey for <u>Cacalia tuberosa</u> , <u>Cypripedium</u><br>candidum and <u>Habenaria leucophea</u> . | Steward<br>ship<br>Group         Erect fence.       Ia         Shore up existing fencing.       Ia         Initiate fire management program.       Ia         Keep a) quantitative and b) qualitative<br>records on smooth brome grass       Ia         Initiate herbicide research project on smooth<br>brome       Ia         Mow railbed and bulldozer scar 1-2 times per<br>year       Ia         Initiate research project on sweetclover       Ia         Establish study project on reed canary grass       Ia         Record observations on reed canary grass prior<br>to each management treatment.       Ia         Survey for <u>Cacalia tuberosa, Cypripedium</u><br>candidum and <u>Habenaria leucophea</u> .       Ia | Steward-<br>shipBegin<br>GroupErect fence.IaInitiate fire management program.IaInitiate fire management program.Ianc (no cost)Keep a) quantitative and b) qualitative<br>records on smooth brome grassIaInitiate herbicide research project on smooth<br>bromeIaMow railbed and bulldozer scar 1-2 times per<br>yearIaStoop-\$2000<br>yearIaInitiate research project on sweetcloverIaInitiate research project on sweetcloverIaRecord observations on reed canary grassIaRecord observations on reed canary grass prior<br>to each management treatment.IaSurvey for Cacalia tuberosa, Cypripedium<br>candidum and Habenaria leucophea.IancIanc | Steward-<br>GroupBegin<br>GroupPhase IErect fence.Ia\$140,000Shore up existing fencing.Ia?Initiate fire management program.Ianc (no cost)Keep a) quantitative and b) qualitative<br>records on smooth brome grassIanc (b)Initiate herbicide research project on smooth<br>bromeIa\$1000-\$2000Mow railbed and bulldozer scar 1-2 times per<br>yearIa\$1000-\$2000Initiate research project on sweetcloverIa(qualitative<br>observation)<br>nc(quantitative<br>study)<br>ncEstablish study project on reed canary grassIa\$50Record observations on reed canary grass prior<br>to each management treatment.IancSurvey for Cacalia tuberosa, Cypripedium<br>candidum and Habenaria leucophea.Ianc | Steward-<br>ship       Begin<br>Group       Immediately       Phase I       Phase II         Erect fence.       Ia       \$140,000       Immediately       Phase II         Shore up existing fencing.       Ia       ?       Immediately       Phase II         Initiate fire management program.       Ia       nc (no cost)       Immediately       Immediately <td< td=""></td<> |

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|             |                                                                                                                                                                                  | Steward-      | -<br>De sés          |         |          |                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|---------|----------|----------------------------------------------|
| Action      |                                                                                                                                                                                  | snip<br>Group | Begin<br>Immediately | Phase I | Phase II | Comments                                     |
| Action #27. | Census <u>Asclepias sullivantii</u> , <u>Parthenium</u><br><u>integrifolium</u> , <u>Cacalia tuberosa</u> , <u>Valeriana</u><br><u>edulis</u> , and <u>Cypripedium calceolus</u> | I             | nc                   |         |          | On-going                                     |
| Action #28. | Record observations on rare plants prior to each management treatment.                                                                                                           | I             | nC                   |         |          | On-going                                     |
| Action #30. | Annually survey for herbicide damage.                                                                                                                                            | Ia            | nc                   |         |          | -On-going<br>-Coordinate with Action #29.    |
| Action #31. | Annually survey for encroachments.                                                                                                                                               | Ia            | nc                   |         |          | -On-going<br>-Coordinate with Action #27.    |
| Action # 5. | Clean up trash.                                                                                                                                                                  | II            | nc                   |         |          | Will require a work crew for major clean-up. |
| Action # 9. | Develop a trail on the former railbed.                                                                                                                                           | II            |                      | X       |          | Funded by DNR Trails and Waterways           |
| Action #10. | Obtain access from Front Street (in Dexter).                                                                                                                                     | II            |                      | X       |          |                                              |
| Action #11. | Construct parking areas at road intersections.                                                                                                                                   | II            |                      | x       |          |                                              |
| Action #12. | Provide bus parking.                                                                                                                                                             | II            |                      |         | \$2000   |                                              |
| Action #13. | Eliminate parking in the "triangle"                                                                                                                                              | II            | nc                   |         |          | Coordinate with Action #7.                   |
| Action #14. | Post rules and regulations signs.                                                                                                                                                | II            | 77                   |         |          | 14 signs @ \$3.00/sign+2.50/post             |

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| Action #15. | Post entrance signs.        | II  |     | \$100 |                                                                          |
|-------------|-----------------------------|-----|-----|-------|--------------------------------------------------------------------------|
| Action #16. | Erect interpretive signs.   | II  | 175 |       | \$100 preparation costs<br>15 signs @ \$5.00/sign                        |
| Action #32. | Systematically survey fauna | III |     | Cost? | Survey will likely be done<br>separately for different faunal<br>groups. |

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Labor - Work crews above and beyond DNR staff will be necessary for Action #8 ½mi/day - 2 person crew Action #5 3 days - 2 person crew

nc - no cost

## Appendix

## Sweet Clover Management

Control Factors

A. Critical Growth Periods

1st year plants - Late summer. Top growth efforts of the plant decrease

and root growth accelerated. Root reserves are important for winter survival and second year growth.

2nd year plants - Early summer, just before flowering.

B. Persistance

Sweet clover produces a large proportion of hard (dormant) seeds that are long lived in the soil. Germination can be stimulated by burning and physical disturbance.

C. Competitive Ability

Sweet clover is a poor competitor at the seedling and early vegetative stages. Second year plants grow rapidly in the spring and competes effectively with newly arising plants. Sweet clover will not persist in a perennial sward, however long-lived seeds in the soil can perpetuate a population.

D. Germination and Perenniation

Seedlings can appear any month of the year although there are pronounced peaks of emergence in March-April and September-October. Annual and biennial forms exist. Annual individuals overwinter as seeds and biennial individuals overwinter alternately as seeds and as thick tap roots with a crown and winter buds.

| Life History<br>Phase                   | Control<br>Method                           | Timing                | R€<br>Yrl | epetitio<br>Yr2 | n<br>Yr3 | Comments                                                                                                                                                                                                           |
|-----------------------------------------|---------------------------------------------|-----------------------|-----------|-----------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lst y <b>e</b> ar plant<br>(Vegetative) | Burn                                        | Late summer           | ~         | ?               | ?        | Repetition depends on complementary management<br>practices. Crops are still apt to be in<br>adjacent fields                                                                                                       |
|                                         | Mow                                         | -                     | -         | -               | -        | <ul> <li>Does not provide effective control</li> <li>Equipment does not cut low enough to ground.</li> <li>Some reduction of vigor is possible.</li> </ul>                                                         |
|                                         | Herbicide<br>2,4-D<br>(Glyphos-<br>phate)   | Summer                | ~         | ?               | ?        | •Repetition depends on degree of control. 1st yr<br>plants more susceptible than 2nd yr. plants.                                                                                                                   |
|                                         | Handpulling                                 | Summer                | ~         | V               | ~        | •Difficult to grasp                                                                                                                                                                                                |
| 2nd year plant<br>(Flower<br>bearing)   | Burn                                        | Early<br>summer       | ?         | ~               | -        | •Repetition will depend on perenniation (annual is biennial) and population age structure (even age, uneven aged).                                                                                                 |
|                                         | Mow                                         | Early<br>summer       | ?         | 2-3<br>times    |          | <ul> <li>Same comments as under burning.</li> <li>Should wait until lower branches begin to die back from self shading.</li> </ul>                                                                                 |
|                                         | Herbicide<br>Glyphos-<br>phate<br>(2,4-D)   | Early<br>summer       | ?         | ~               | -        | <ul> <li>Same as burn</li> <li>Wick application of glyphosphate (Round-up) when sweetclover is taller than surrounding vegetation.</li> <li>2,4-D less effective on 2nd yr. plants than 1st yr. plants.</li> </ul> |
|                                         | Handpulling                                 | Early summer          | ?         | ~               | -        | •Same as burn                                                                                                                                                                                                      |
| Seed                                    | Burn -<br>stimulates<br>seed<br>germination | Fall,<br>early spring | ~         | -               | -        | Preparation for any of the control methods<br>described above releases maximum amount of<br>sweet clover so that control methods will be<br>directed at the 'whole' sweet clover population.                       |

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![](_page_55_Picture_0.jpeg)

![](_page_56_Picture_0.jpeg)