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MANAGEMENT PLAN  
FOR  
BLACK DOG PRESERVE  
SCIENTIFIC AND NATURAL AREA

Portions of  
Sections 27 and 34  
Township 27 North, Range 24 West  
Bloomington Quadrangle  
Burnsville Township  
Dakota County  
Minnesota

Prepared by  
The Scientific and Natural Areas Program  
Section of Fish and Wildlife  
Minnesota Department of Natural Resources  
March 1985

in cooperation with  
The Nature Conservancy, and  
U.S. Fish and Wildlife Service

Approved by:

DNR

FWS

TNC

F 612  
B54 M36  
1985

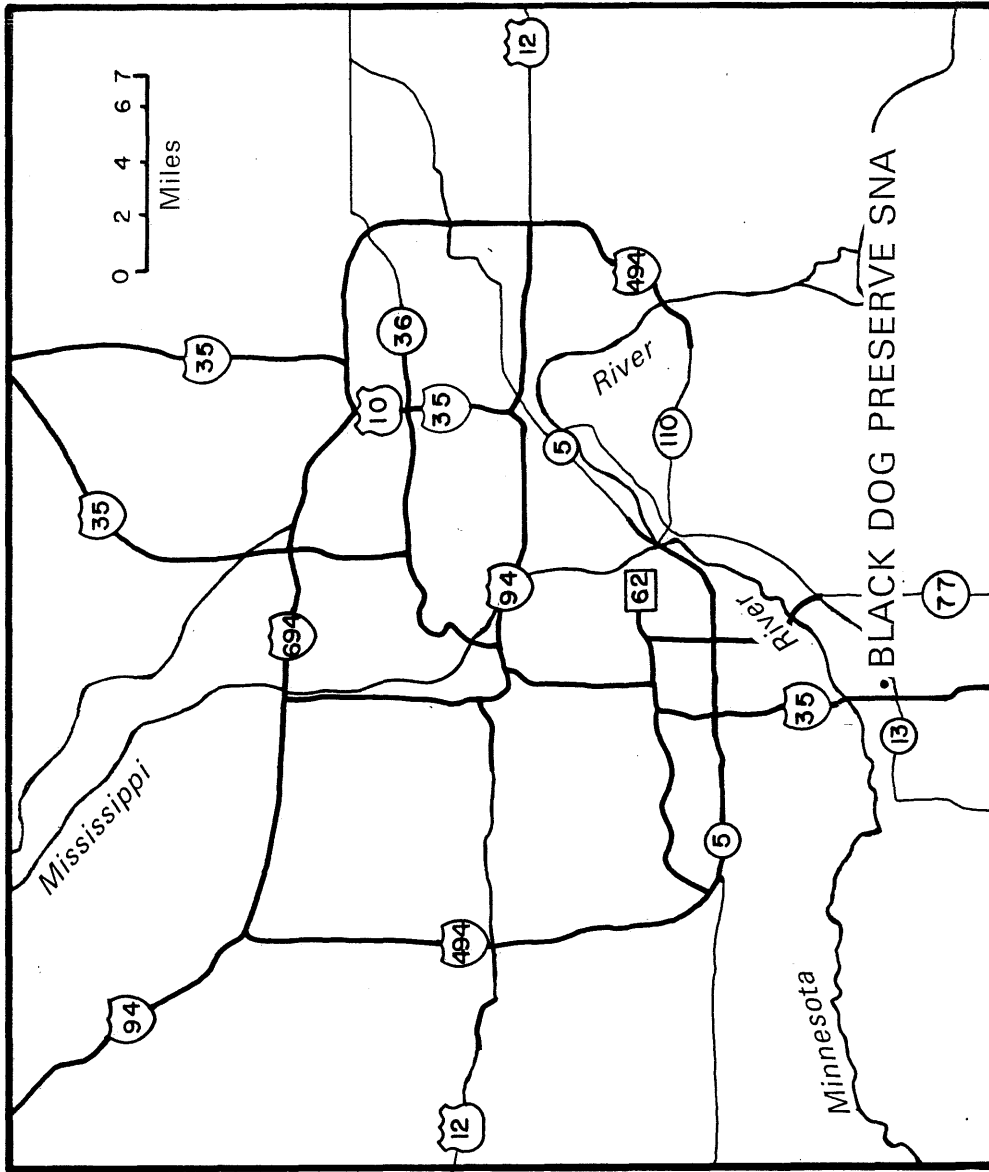
This SCIENTIFIC and NATURAL AREA was established to protect and perpetuate Minnesota's rare and unique natural resources for nature observation, education and research purposes.

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

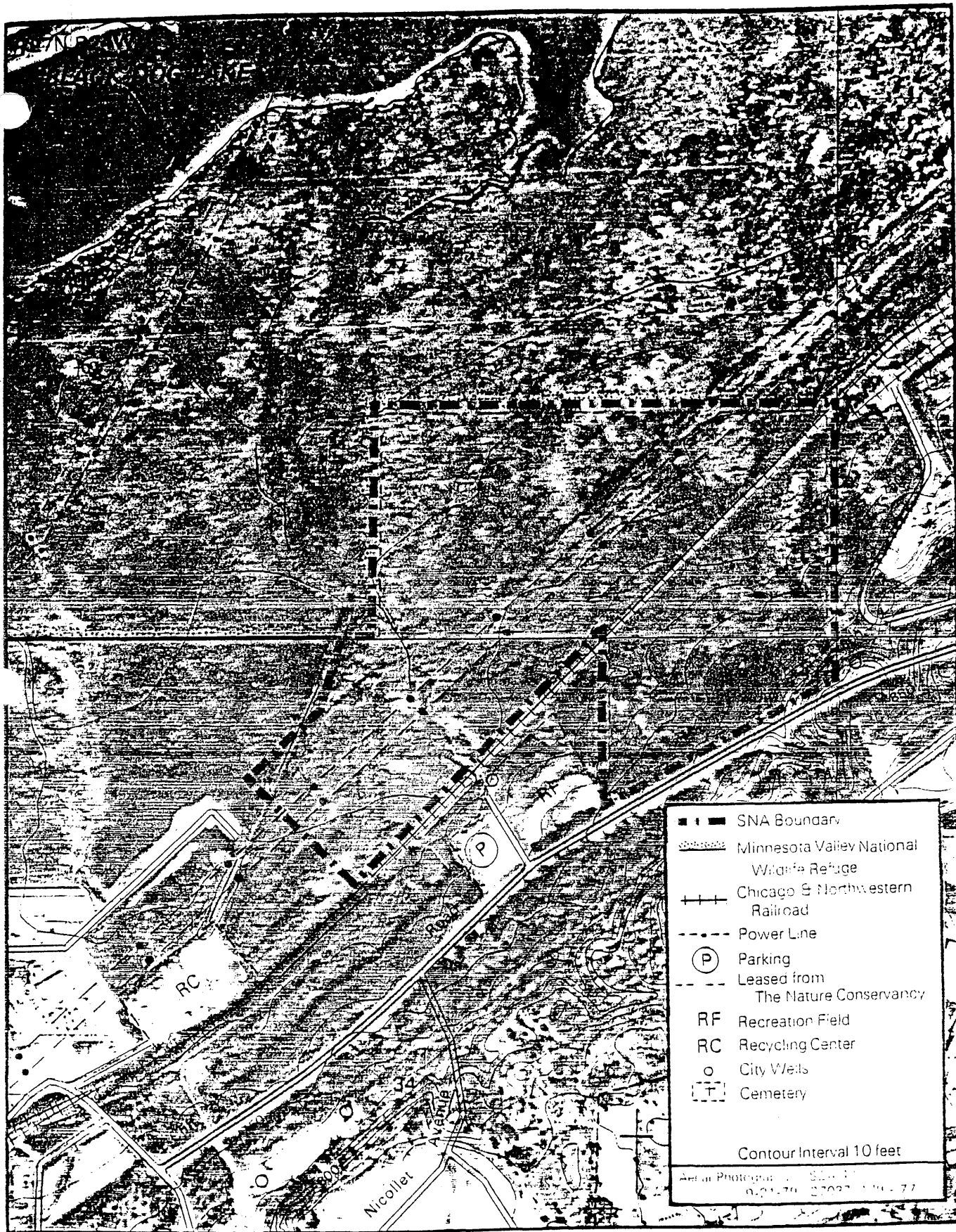
- Collecting plants, animals, rocks or fossils.
- Camping, picnicking and swimming.
- Horses, dogs and other pets.
- Snowmobiles and other motorized vehicles.
- Hunting, trapping, fishing and boating.
- Entry into restricted areas and sanctuaries.

WALK GENTLY

MINNESOTA DEPARTMENT OF NATURAL RESOURCES







0 1/4 1/4 mile  
 0 200 m 400 m

# BLACK DOG PRESERVE SNA

SITE



## 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 and serve as outdoor classrooms for teachers. They are areas against which the effectiveness of resources management techniques employed elsewhere can be evaluated. Scientists use Scientific and Natural Areas as control areas when investigating natural processes or environmental contamination. And lastly, Scientific and Natural Areas protect the best, and/or last remaining occurrences of a rare species or plant community.

However, land protection alone does not assure long term preservation of natural areas and their endangered species. Many natural areas will decline in quality if 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 Scientific Natural Areas Program and the Natural Heritage Program. Funding was provided by the Legislative Commission on Minnesota Resources.

## SUMMARY OF MANAGEMENT PROGRAMS

### General Management Considerations

Black Dog Preserve Scientific and Natural Area (SNA) is located within the Minnesota Valley National Wildlife Refuge/Recreation Area and State Trail. The Black Dog Preserve management plan has been coordinated and is consistent with the Comprehensive plan and Technical reports for this 72 mile long open space system. The level of management activity in the SNA will be high. Surveillance and enforcement will be the cooperative effort of the DNR, FWS, and local law authorities. There are 6 easements on the SNA for sewerline maintenance, stormwater discharge, and powerline maintenance. In addition 100 acres of the SNA is leased from The Nature Conservancy. Use will be restricted in the highest quality fen area.

### Structures and Facilities

A unit trail will be constructed to route visitors away from sensitive areas and provide access to the National Wildlife Refuge. The trail will be accompanied by a trailhead with an information kiosk located next to the park-and-ride lot. An interpretive package for the trail will be developed. Signing requirements include boundary signing, posting of rules and regulations, and two entrance signs.

### Vegetation Management

Prescribed fire will be the major management activity. Burn units have been coordinated with FWS burn units. Objectives and constraints for fire management are presented.

Plant community monitoring studies are proposed to document 1) change in vegetation components being manipulated through management activities, 2) change in components that will yield the greatest predictive capabilities, and 3) those components that can be best monitored at this site vs other sites. Rare plant management will include annually surveying rare fen annuals, and censusing rare fen perennials within localized occurrences.

Problem plants that are management concerns include: purple loosestrife (Lythrum Salicaria), buckthorn (Rhamnus cathartica), reed canary grass (Phalaris arundinaceae), rhizomatous wetland perennials (Typha spp., Phragmites communis) and trees (Populus deltoides, Populus spp.). Purple loosestrife and buckthorn will be controlled both on the SNA and adjacent lands. Reed canary grass and rhizomatous wetland perennials will be studied and controlled within the SNA. Trees will be cut and removed where fire management is ineffective or impractical.

### Hydrology

There are several human-induced stresses on hydrological system at Black Dog Preserve that may affect the calcareous fen community. The hydrology of the fen and supporting aquifers will be studied. The SNA program will also participate in the preparation of local surface watershed management plans. The abandoned municipal ditch on the east side of the SNA will be plugged or filled.



### Additional Inventory Needs

The floral inventory will be completed. The fauna will be systematically surveyed with priority given to invertebrate groups that are potentially dependent on specific host plants or environmental conditions restricted to the SNA.

### Adjacent Lands

The FWS will designate the mesic prairie on their property adjacent the SNA as an RNA or Public-Use RNA. The DNR and FWS will manage the prairie cooperatively as one natural feature. This plan will serve as the coordination plan for that purpose.

Public or private efforts to acquire the portion of the Astleford Co. property containing fen habitat will be encouraged. Cooperative agreements with M.G. Astleford Co., Minnegasco and the City of Burnsville will allow for management of these adjacent properties for prescribed burning, research, and problem species control.

# TABLE OF CONTENTS

v

	<u>PAGE</u>
PREFACE	ii
SUMMARY OF MANAGEMENT PROGRAMS	iii
OVERVIEW	1
Description	1
Preservation Value	1
ORA Classification	2
Management Philosophy	2
1. GENERAL MANAGEMENT CONSIDERATIONS	3
A. Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail	3
B. Level of Management Activity	3
C. Surveillance and Enforcement	3
D. Easements	4
E. User Restrictions	4
2. STRUCTURES AND FACILITIES	6
A. Trails	6
B. Parking	7
C. Access	7
D. Signing	7
3. VEGETATION MANAGEMENT	9
A. Fire Management	9
B. Plant Community Monitoring	10
C. Rare Plant Management	11
D. Problem Plant Management	12
4. HYDROLOGY	17
A. Groundwater Hydrology	17
B. Surfacewater Hydrology	18
5. ADDITIONAL INVENTORY NEEDS	20
6. ADJACENT LANDS	21
A. Minnesota Valley National Wildlife Refuge	21
B. Astleford Property - Undeveloped	21
C. City of Burnsville Property	22
D. Minnegasco Property	22
7. EFFECTS OF MANAGEMENT ON SIGNIFICANT RESOURCES	23
A. Calcareous Fen	23
B. Rare Fen Annuals	23
C. Rare Fen Perennials	23
D. Prairie-Fen Species	23
E. Wet and Mesci Blacksoil Prairie	23
8. MANAGEMENT COSTS AND IMPLEMENTATION	24

## OVERVIEW

### Description

The Black Dog Preserve Scientific and Natural Area (SNA) is located within the city limits of Burnsville, in northwestern Dakota County. It includes 130 acres in the broad valley of the Minnesota River, extending northward from the base of the valley bluffs south of the river, approximately 1/2 mile into the valley bottoms. The primary natural features at the SNA are a calcareous fen complex and a mesic blacksoil prairie.

Black Dog Preserve is part of the Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail. The Black Dog Unit of the Minnesota Valley Refuge borders the north boundary of the SNA. Together they form a coherent conservation area protecting a major portion of the floodplain along this stretch of the river.

The surrounding seven county metropolitan area is highly urbanized with over 2 million people. The City of Burnsville is one of the fastest growing communities in the state. The bluffs and valley bottoms have experienced light industrial, commercial and residential development.

### Preservation Value

Black Dog Preserve SNA is situated on the boundary between the southern Oak Barrens and the Mississippi River Sand Plains landscape regions. This site preserves a small sample of the original Minnesota Valley landscape. 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 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. Black Dog Preserve SNA contains two critically endangered and one endangered plant communities, 4 threatened plant species and 4 plant species of special concern.

### Plant Communities

#### 1. Calcareous Fen - critically endangered in the state

A calcareous fen is a grass-sedge dominated peatland fed by groundwater rich in calcium and magnesium bicarbonates. They are characterized by a distinctive assemblage of plants adapted to wet calcareous substrates. Conditions associated with calcareous peat soils are low oxygen availability, cold temperatures and low nutrient availability. Minnesota fens may be dominated by herbaceous plants or by shrubs. Calciphilic plant species form a significant component of the fen flora. The calcareous fen community is very uncommon throughout its entire range. It is threatened by agricultural activities (draining, ditching, and filling) commercial development, and road construction.

#### 2. (SE) Mesic Blacksoil Prairie - critically endangered in the state

This prairie type is the most productive and species rich prairie community in Minnesota. The flora shows a strong eastern and southern influence with only minor representation from the Great Plains flora to the west. The vegetation is

dominated by mesic prairie grasses: big bluestem (Andropogon gerardi), Indian grass (Sorghastrum nutans) and prairie dropseed (Sporobolus heterolopus). The associated forb species are yellow cone flower (Ratibida pinnata), blazing star (Liatris ligulistylis), Canada tick trefoil (Desmodium canadense), blazing star (Liatris pycnostachya), and frost aster (Aster ericoides).

### 3. Wet Blacksoil Prairie -- endangered

This prairie community is found on poorly drained muck to better drained silty clay loam soils. The vegetation is dominated by prairie cordgrass (Spartina pectinata), big bluestem (Andropogon gerardi), and tall sunflower (Helianthus grosserratus). The most common associated species are New England aster (Aster novae-angliae), blazing star (Liatris ligulistylis), Mountain mint (Pycnanthemum virginianum) and Joe-pye weed (Eupatorium maculatum).

### Rare Plant Species

Four plant species occurring on Black Dog Preserve SNA are listed as threatened under the Minnesota Endangered species law (MS 97.488) and four are listed as species of special concern. These species are listed below:

Carex sterilis (a species of sedge) - threatened - occurs in the fen  
Rhynchospora capillacea (slender beak-rush) - threatened - occurs in the fen  
Scleria verticillata (whorled nut-rush) - threatened - occurs in the fen  
Valeriana edulis (valerian) - threatened - occurs in the fen and prairie  
Cladium mariscoides (twig rush) - special concern - occurs in the fen  
Triglochin palustris (marsh arrow-grass) - special concern - occurs in the fen  
Tofieldia glutinosa (false asphodel) - special concern - occurs in the fen

### ORA Classification

The Black Dog Preserve 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: Carex sterilis, Rhynchospora capillacea, Scleria verticillata, Cladium mariscoides, Triglochin palustris, Tofieldia glutinosa, and Cypripedium candidum, (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 Black Dog Preserve SNA are (1) the high natural quality and diversity of the natural communities, and (2) the presence of several rare species. The major management problems are controlling woody encroachment and exotic plants, stagnation of native species due to cessation of fire, human modifications of the groundwater system, and impacts of visitor use. The increasing magnitude of these problems and inherent dynamic nature of these plant communities necessitates direct habitat management for this SNA.

## Section 1

### GENERAL MANAGEMENT CONSIDERATIONS

#### A. Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail

The Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail is a 72 mile open space system following the Minnesota River from LeSueur, to its confluence with the Mississippi River in the Minneapolis-St. Paul metropolitan area. Protection of this river corridor has become a cooperative resource management venture involving federal, state, and local lands. These lands and resources have been coordinated and planned for the comprehensive development and management of the recreation, wildlife and other resources found in the lower Minnesota Valley.

Black Dog Preserve SNA is located within this open space system. Preparation of the management plan for this SNA has been coordinated, and is consistent with the:

Minnesota Valley Comprehensive Plan  
(Department of the Interior, U.S. Fish and Wildlife Service;  
and the Minnesota Department of Natural Resources - November 1983)

Minnesota Valley State Technical Report  
(Minnesota Department of Natural Resources - February, 1984)

#### B. Management Resources

The type of management that takes place in an SNA is dependent on need and availability of management resources. Some important considerations in this regard are presented below:

##### a. Distance from St. Paul and Other Regional Offices

Black Dog Preserve SNA is approximately 20 miles from St. Paul based SNA staff. Additional management assistance could be provided by the DNR MN Valley Trail Manager (Jordan), Ft. Snelling State Park (10 miles northeast), Fish and Wildlife Refuge headquarters (5 miles northeast) and The Nature Conservancy staff (Minneapolis). The proximity of Black Dog Preserve SNA to these offices permits frequent management activities over the entire year.

##### b. Proximity to University and College Campuses

The Minneapolis-St. Paul area has many universities and colleges. Several have current research programs dealing with topics similar or related to resources protected in the SNA. The SNA Program should be able to solicit some research attention to Black Dog Preserve SNA from these institutions.

##### c. Surveillance and Enforcement

Nonconforming uses or overuse can damage natural conditions and the aesthetic appearance of natural areas. Because of the fragility of nature preserves, their

continued protection and maintenance requires systematic surveillance and enforcement.

Enforcement is the responsibility of The DNR Conservation Officer, DNR staff and local law authorities. Once the trail is developed (see Trail 2.1) the FWS will regularly patrol the area. Additional protection can be provided by developing local support and recognition of the SNA. Local residents and visitors are encouraged to report any signs of problems or non-conforming uses.

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Action 1.1 Regularly contact the Burnsville Police Department.

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Considerations:

Frequency - Contact annually to get reports of any enforcement problems relating to the trailhead (see Action 2.1).

D. Easements and Leases

There are several easements and leases on the SNA property. These are:

1. Northern State Power Easement (225-500' wide) - No structures allowed under the power lines. Tree growth will be controlled. NSP has the right to enter the property for maintenance activities.
2. Metro Sewer Easement, north of railroad tracks (35' wide) - A perpetual easement for sanitary sewer purposes.
3. Burnsville Sewer Easement and public access (35' wide?) - A perpetual easement for sanitary sewer purposes and public access.
4. Metro Sewer Easement, south of railroad tracks (35') - A perpetual easement for sanitary sewer purposes.
5. Burnsville Stormwater Easement - Creek - Reserves the right to discharge stormwaters into existing stream.
6. Burnsville Stormwater Easement - Ditch - Reserves the right to discharge stormwaters into existing ditch.

Burnsville has agreed to relinquish its rights to this ditch when plans for the Astleford development are completed and construction of storm sewers directs drainage to the west and north.

7. DNR-TNC Lease (100 ac) - The DNR will lease 100 acres from The Nature Conservancy (TNC) for the purpose of establishing and maintaining the Black Dog Preserve SNA.

E. Use Restrictions

The Fen-A cover type is the highest quality fen habitat. It is particularly

vulnerable to potential degradation from visitor use because it is:

- a) close to the Park and Ride lot
- b) a small, well defined, easily recognized area
- c) a destination point for visitors

User pressure on this fen area is expected to be undesirably high.

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Action 1.2 Post Fen A as a Restricted Area.

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Considerations:

Purpose - To protect the high quality of Fen A.

Signing - The perimeter of Fen A will be posted with "Restricted Area" signs.

Use - Use will be allowed by permit only. Permits will be restricted to uses which:

- 1. cannot be facilitated elsewhere
- 2. are part of an approved research project
- 3. are necessary for implementing management activities prescribed in this plan, or amendments to this plan.

## Section 2

### STRUCTURES AND FACILITIES

#### A. Trails

##### Anticipated Use

The Minnesota Valley Comprehensive Plan has projected a total annual trail use of greater than 1/2 million people for the completed trail system between Ft. Snelling State Park and LeSueur. The Comprehensive Plan identifies the Cliff Rd Park and Ride Lot as an access point to the multi-use, Minnesota Valley corridor trail which will parallel Cliff Rd. in the vicinity of the SNA. The City of Burnsville has built recreational fields adjacent the Park and Ride Lot.

All this related activity will inevitably result in the SNA experiencing a considerable amount of public use. Because of the sensitive nature of the resources, use must be controlled and routed away from sensitive resources.

##### Refuge Trail

The Minnesota Valley Comprehensive Plan, and the FWS Unit Plan for the Black Dog Lake Unit of the Refuge identify the need for a secondary trail within the Black Dog Unit. This trail would provide service and patrol capabilities, and public access for wildlife interpretation and observation. Permitted uses would be hiking and cross-country skiing. This secondary trail would lead from Black Dog City Park on the east (across from the NSP power plant) to the Cliff Rd. Park and Ride Lot. Access to the Park and Ride Lot would require crossing the SNA.

##### SNA Trail

A Trail can be provided through the SNA that would accommodate the anticipated public use and provide access to the Refuge trail. Facility development would follow design guidelines established for the Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail.

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Action 2.1 Construct a DNR unit trail through the SNA.

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##### Considerations:

Purpose - To provide access through the SNA to the FWS trail with a minimum of resource damage. No additional trails will be constructed in the SNA unless they are necessary to alleviate damage from trail users leaving the main trail.

Alignment - Make maximal use of previously disturbed areas such as the Metro Sanitary Sewer easement. Do not cross any fen areas.

Surface - A simple mowed trail surface. Cottonwoods on the sewer easement will be removed to provide for the trail and permit reestablishment of prairie vegetation (see also Action 3.10). Construction and maintenance of the trail will be done by hand.



Trailhead - To be developed at the northeast corner of the Park and Ride Lot. Will include information kiosk, graphics, entry trail and railroad crossing. Development will be a joint project involving DNR, TNC, FWS and Burnsville.

Railroad Crossing - Will be gated to prevent unauthorized vehicle use. The design must stop motorbikes and 3-wheeled vehicles.

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Action 2.2 Develop an interpretive package for the trail.

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Considerations:

Kiosk Information - To include: map of SNA, description of the significant natural features present, identify the coordination and contributions of various agencies and organizations, in particular The Nature Conservancy.

B. Parking

Sufficient parking space is available at the Park and Ride Lot. No further facility development is required for this purpose.

C. Access

Access to the SNA will be provided by the trail (see Action 2.1).

Public access for management purposes will be provided by a public access easement to the northwest corner of the SNA; parallel to, and extending from the proposed alignment of 121st Street.

D. Signing

Signing will follow guidelines developed for the Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail. Boundaries will be posted with standard SNA boundary signs, and in some cases jointly with TNC boundary signs. Surveying should not be necessary.

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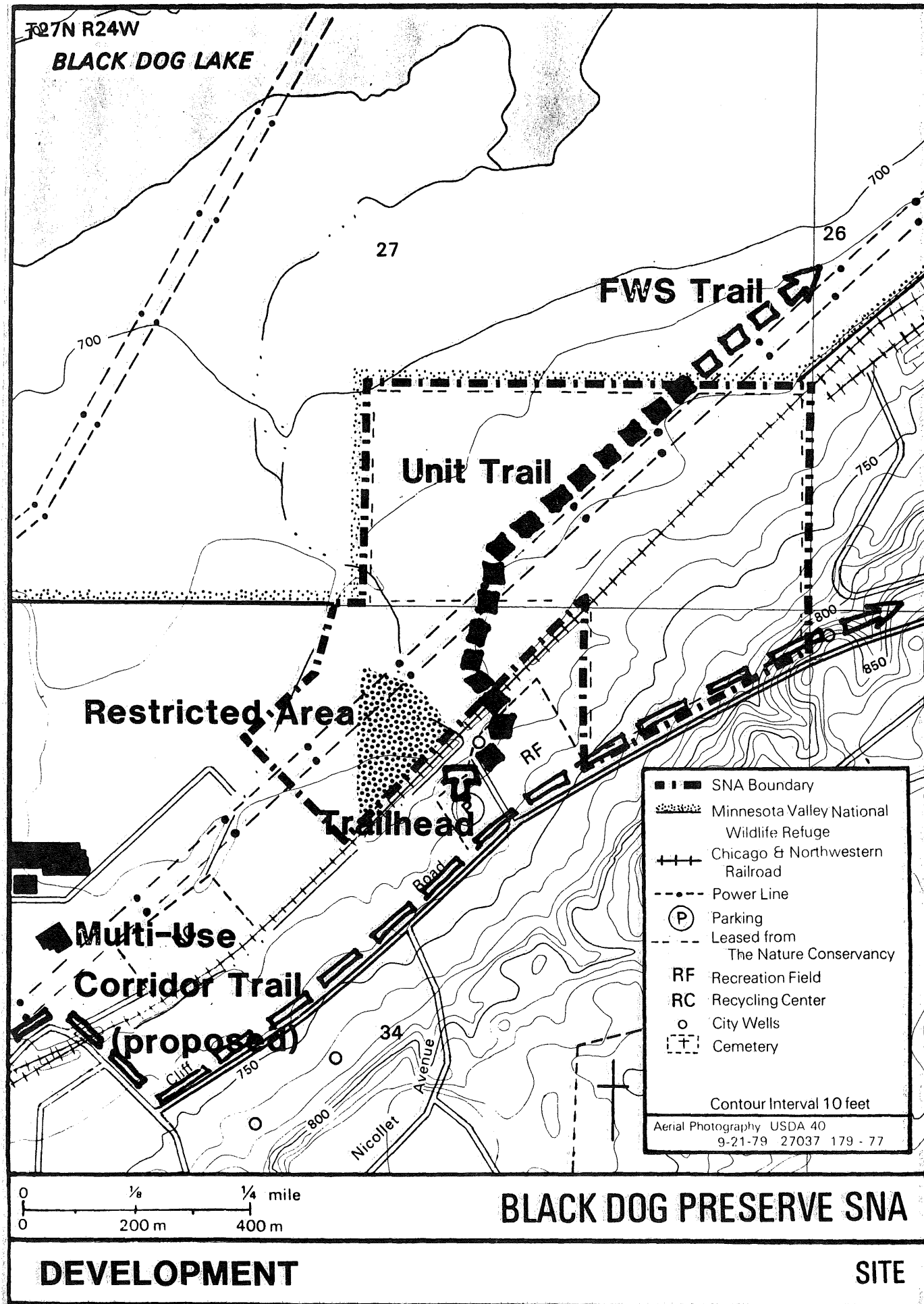
Action 2.3 Post SNA boundaries.

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Considerations:

Refuge Boundary - Sign jointly with FWS using the same posts.

Boundary - A portion of the designated SNA is leased from TNC. The joint TNC-SNA boundary will be posted with TNC and SNA signs. The property boundary between TNC and DNR land in the interior of the SNA will not be posted.



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Action 2.4 Post SNA entrance signs.

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Considerations:

Trailhead Entrance - Entrance sign here will be designed into the trailhead area.

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Action 2.5 Post SNA rules and regulation signs at trail entrances.

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Considerations:

Location - One at trailhead entrance and one at Refuge trail entrance along north boundary of the SNA.

## Section 3

### VEGETATION MANAGEMENT

#### A. Fire Management

Prescribed burning will be a major management activity on the entire preserve and adjacent refuge land. The primary purposes of burning are to enhance native vegetation, suppress encroachment of trees and shrubs, and reduce competition from undesirable problem species. The consensus among experts in Minnesota is that prairies naturally burned at intervals of 1 to 4 or 5 years and, except in severe drought, fires occurred in the dormant season. Fire, in general, will have a positive impact on the natural area. Under low soil moisture conditions, organic soils within the SNA may become flammable. However these soils are commonly saturated.

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#### Action 3.1 Conduct prescribed fires.

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##### Considerations:

##### Objectives:

###### General

1. Produce unit to unit variation in vegetation structure (mulch, plant density, height etc.).
2. Coordinate SNA burn units with FWS burn units.
3. Use dormant season fire to remove 70% or more of the 1 hour time lag fuels (fine fuels) in each unit at least once in 5 years.

###### Woody Vegetation

1. Maintain less than 30% shrub coverage on peat and muck soils with a distance between crowns greater than the size of the crowns.
2. Maintain less than 10% tree and shrub coverage on mineral soils.
3. Control the height of all woody species within the NSP powerline easement to less than 20 feet.

###### Fen

1. Maintain or enhance fen areas to rank a or b (see Resource Inventory Appendix II).

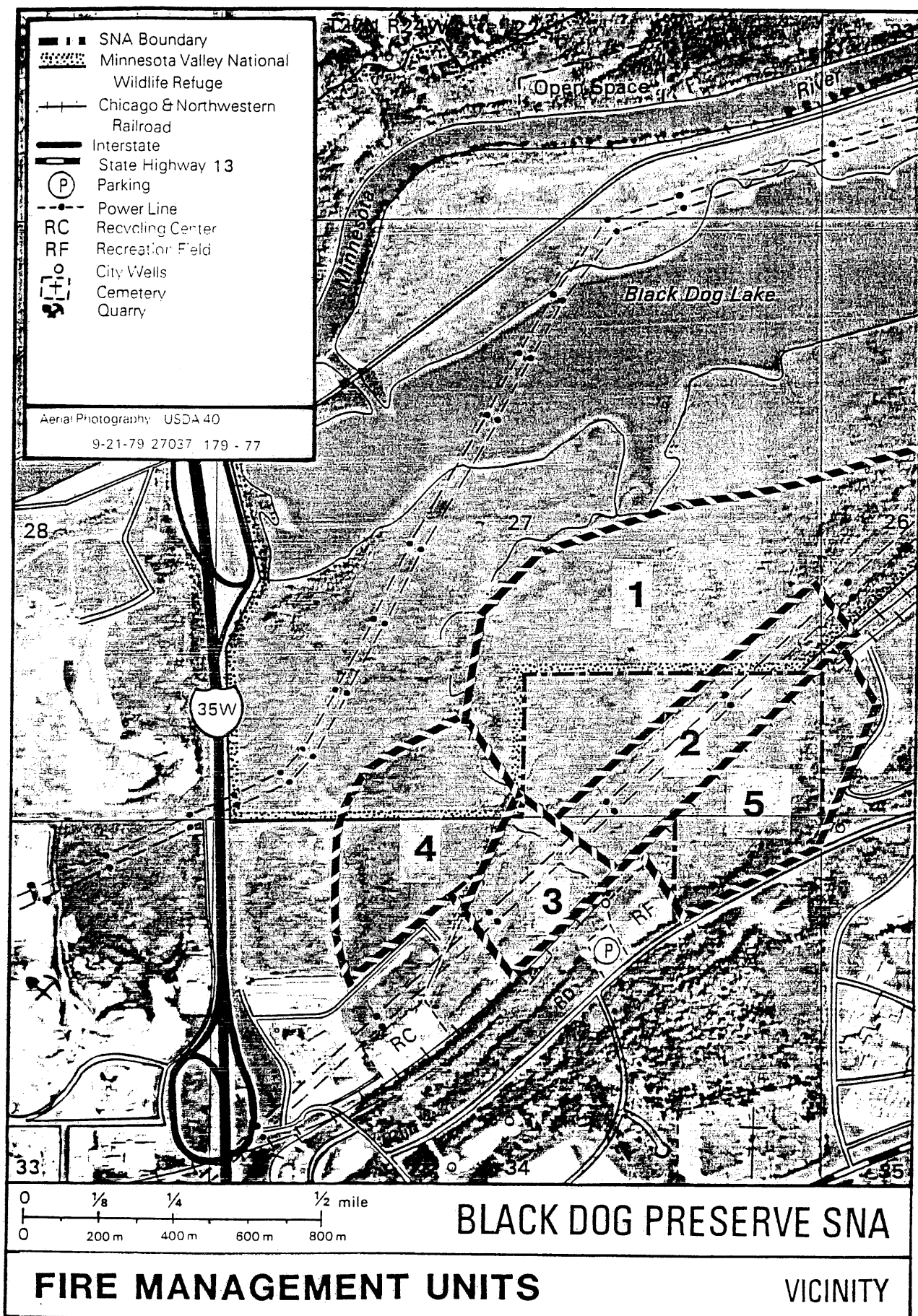
###### Rare Plants

1. Adjust management if significant reductions of any of the 8 rare species appears related to fire management prescriptions.

##### Constraints:

###### General

1. Wetness of peat and muck soils limits mobility, equipment use, and timing of burn.
2. Peat is flammable. Burning must occur under high moisture





conditions to avoid "peating in". Ditch spoils and other areas of disturbed peat are generally drier and present problems for mop-up.

Smoke Management Concerns

1. Burnsville Industrial Park and Astleford development
2. Interstate 35W
3. Residential and commercial development within 1/4 mile to the south
4. Railroad - actively used
5. High voltage powerlines - potential for arcing

Hazards

1. Telephone lines on south side of railroad tracks with wooden poles. Fuels underneath are primarily Phragmites communis.
2. High voltage lines NW of the SNA with creosote treated wooden poles.
3. Trail users.

Fire Units - see map

Fire Unit 1  
Fire Unit 2  
Fire Unit 3  
Fire Unit 4  
Fire Unit 5

B. Plant Community Monitoring

A system for documenting change in the vegetation is necessary to evaluate the effects of management activities, and the responses of the vegetation to other environmental variables.

Community monitoring activities will be prioritized based on (1) those vegetation components that are being manipulated through management activities, (2) those components that will yield the greatest predictive capabilities, and (3) those components that can be best monitored at this site vs. other sites.

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Action 3.2 Establish plant community monitoring studies.

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Considerations:

First priority - Record the change in groundlayer vegetation following a reduction in shrub coverage in fen cover types.

- Record the response of the fen-sloping cover type to removal of cottonwoods along Cliff Rd. (see Action 3.11).

Record the response of the vegetation to filling or stopping the ditch (see Action 4.3).

Second priority - Establish plots or transects in the Fen A cover type and

record response to fire management and other variables.

Third priority - Record the response of Mesic Blacksoil Prairie vegetation to fire management.

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Action 3.3 Establish a photo documentation program for the Fen A cover type.

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Considerations:

Timing - Fens are showiest in the late summer, early fall.

Implementation - Include as part of the volunteer phenology project being conducted by the Friends of the Minnesota Valley.

C. 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 population 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 Black Dog Preserve 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.

"Friends of Minnesota Valley" is a volunteer organization for the Minnesota Valley National Wildlife Refuge. This group has a vegetation transect through parts of the fen cover types A and B that they visit weekly during the growing season to record blooming phenology.

Eight rare plants occur on the SNA.

Scleria verticillata, Rhynchospora capillacea, and Triglochin palustris are all fen obligates, annuals, and are well distributed in the fen cover type. As annuals their populations may fluctuate widely and are difficult to census.

Cladium mariscoides, Tofieldia glutinosa, and Cyperidium candidum are perennials, have low numbers and localized occurrences in the Fen A cover



type. Cladium and Tofieldia are fen obligate species. Cyperidium candidum occurs both in the fen and prairie. Cladium mariscoides is rhizomatous with both sterile and fertile stems.

Carex sterilis and Valeriana edulis are long lived perennials and are well distributed in the fen cover type. Valeriana also occurs on the prairie. Each plant of Carex sterilis and Valeriana edulis is a distinct individual.

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Action 3.4 Annually record presence/absence of rare fen annuals.

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Considerations:

Species - To include Scleria verticillata, Rynchospora capillacea, and Triglochin palustris

Timing - Late July through August

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Action 3.5 Count stems of rare fen perennials with localized occurrences.

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Considerations:

Species - To include Cladium marsicoides, Tofieldia glutinosa and Cyperidium candidum

Timing - Cladium and Tofieldia in late July-August, Cyperidium candidum in late May-early June

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D. Problem Plant Management

Five species, or groups of species, have been identified as potential problem plants. These are:

1. purple loosestrife (Lythrum salicaria)
2. buckthorn (Rhamnus cathartica)
3. reed canary grass (Phalaris arundinaceae)
4. rhizomatous wetland perennials (Typha latifolia, T. angustifolia, Phragmites communis)
5. Trees-Cottonwood, Aspen, Willow (Populus deltoides, Populus spp, Salix spp)

The objectives of problem plant management at Black Dog Preserve SNA are:

1. to arrest expansion
2. to identify real threats to native species
3. to avoid soil disturbance, particularly on organic soils.

PURPLE LOOSESTRIFE

Present Status

Purple loosestrife occurs as scattered individuals in moist soil habitats on the SNA, and a few more heavily infested areas occur NW of the SNA (approx. 1-2 ac).

#### Threat

Purple loosestrife is potentially capable of forming a persistent monotype, displacing native species. Its present distribution in the SNA demonstrates that it is capable of colonizing high quality fen areas. Spring flooding of the Minnesota River and the creek will likely function as continual transporters of seeds or propagules into the area, making control an ongoing effort.

#### Control Capability

The only compatible methods of control are hand treatments. These include hand pulling, cutting, spot burning, or spot herbicide application. They are typically conducted during the blooming period (late July-August). The relative efficiency and effectiveness of these different methods is undetermined. Herbicide use is least desirable on the SNA. The prescribed burning program is not expected to directly control purple loosestrife.

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Action 3.6 Conduct a control program for purple loosestrife on the SNA and adjacent properties.

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#### Considerations:

Initial Treatment - Intensive control effort required, labor intensive. Coordinate with control on adjacent lands.

Monitoring - A system to measure effectiveness of control efforts must be established along with the initial treatment.

Ongoing treatment - Survey and treat the SNA and adjacent lands every 2-3 years. The monitoring system may suggest other treatment schedules.

Herbicides - Herbicides will only be used as a last resort where other methods have failed and the threat to native species justifies their use.

#### BUCKTHORN

#### Present Status

There are presently only a few buckthorn shrubs on the SNA or adjacent areas.

#### Threat

At present there is no threat to native species. At other sites buckthorn is known to be an aggressive invader of fens. It can shade out herbaceous vegetation, displace other native shrubs and dry out the peat. Rhamnus frangula is generally considered to be more aggressive in fens than R. cathartica.

### Control Capability

Cutting or pulling all large individuals should eliminate the shrub. Prescribed burning is expected to control future establishment.

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Action 3.7 Cut or pull all buckthorn shrubs.

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### REED CANARY GRASS

#### Present Status

It occurs as a dense sod in several wet-meadow areas. In addition it has established in locations where the peat surface was disturbed (i.e. sewerline construction). There are also isolated clones scattered throughout the undisturbed moist soil habitats, including high quality fen areas.

#### Threat

Highly competitive species capable of rapidly spreading by seeds and rhizomes. Persistent once established. Scattered clones are capable of responding rapidly to natural or unnatural local revegetation. Seed sources in the area are ubiquitous. Present rate of expansion in the SNA is unknown.

#### Control Capability

Undetermined. Dormant season burns are not expected to affect this cool season grass.

Large stands: Containment may be the only possible management strategy. Treatment should be directed at portions of the stands adjacent high priority native vegetation (i.e. fen, wet prairie)

Isolated Clones: Spot treatment may be feasible. Recolonization of treated areas by native species is more likely than in large stands.

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Action 3.8 Conduct a control program for reed canary grass.

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#### Considerations:

Distribution - Map the distribution of reed canary in the SNA and adjacent fen cover types. Identify the general distribution in other adjacent lands.

Study - Establish a few study areas to monitor displacement of native vegetation by reed canary.

Control - First priority treatment areas are small clones within fen cover types. Identification of compatible treatment methods needs further investigation.

## RHIZOMATOUS WETLAND PERENNIALS (CATTAIL, PHRAGMITES)

### Present Status

Cattail and Pragmites are native dominants in the wetland and some parts of the wet meadow cover types. Both are also pioneering species and occur on previously disturbed sites. Clones also occur as inclusions within fen areas where no disturbance is evident.

### Threat

Persistent once established. These species may encroach on fen vegetation, especially under conditions of low water table, nutrient enrichment, and disturbance. The extent to which encroachment has occurred on the SNA, and the natural dynamics of this phenomena is unknown. The long term persistence of these species on disturbed areas is also uncertain.

### Control Capability

Spot treatment (cutting, pulling) could provide localized control. For cattail, cutting is most effective when root reserves are low. Phenologically this is when the pistillate spathe leaves are beginning to shed and the plant comes into full flower or anthesis. At this time the pistillate spike is lime green, the staminate spike is dark green and has a pebbled appearance.

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Action 3.9 Establish a few study areas to monitor displacement of fen vegetation by cattail and Phragmites.

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## TREES

### Present Status

Fifteen to twenty year old cottonwoods occur on:

- a) ditchspoils from the former sewage treatment plant (these are in poor condition or dead from flooding, beaver cutting and wildfire)
- b) the Metropolitan Sewer easement north of the railroad tracks
- c) fill from the construction of Cliff Rd.

Young cottonwood saplings (<5 yr) occur along the Astleford sanitary sewer extension and the borders of the Astleford Industrial Park.

### Threat

Most fen and prairie fen species are not shade tolerant. Trees affect those species in varying degrees depending on their sensitivity to shade, and orientation and distance from the trees.

### Control Capability

The larger trees (>4" dbh) can be effectively cut and removed. Smaller size class trees will be effectively controlled with prescribed fire. Cooperation

with adjacent landowners can prevent tree establishment along the border of the fen.

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Action 3.10 Cut and remove trees from the Metro Sanitary Sewer easement (see also Trails, Action 2.1).

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Considerations:

Access - East of creek: from trail, west of creek, from Astleford property

Phasing - Burn first to determine need for cutting. Understory fuels will carry fire.

Removal - Wood should be removed to avoid "hot spots" and mop-up problems with prescribed burning.

Timing - Where accessible by the trail: late summer, fall or winter, where not accessible by the trail: when ground is frozen.

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Action 3.11 Cut and remove trees along Cliff Rd.

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Considerations:

Access - From Cliff Rd. or recreation fields

Target - Cottonwoods growing on fill or disturbed organic soils, not trees growing on mineral soil in SE corner of unit.

Fire - Understory fuels may not carry fire well. Because of the high public visibility, trees should be cut and removed rather than fire killed and left standing.

## Section 4

### HYDROLOGY

#### A. Groundwater Hydrology

Fen development requires an abundant supply of groundwater for most of the year. There are two likely groundwater aquifers that could be directly supplying the fen complex; groundwater from the glacial till, and/or the Prairie-du-Chien Jordan aquifer (see Resource Inventory, Hydrology). Interflow characteristics in the peat are dependent on peat stratigraphy, hydrological characteristics of the peat strata, and interruptions of flow. Table 1 is a preliminary list of potential stresses to the groundwater system supplying the fen. Table 2 identifies ecological changes in a fen resulting from hydrological modifications.

Table 1 List of human stresses on the groundwater system

<u>Stress</u>	<u>Effect</u>
1. Quarry dewatering	Creates a cone of depression in the Prairie-du-Chien aquifer
2. Municipal well pumping	Pumping during certain periods lowers the potentiometric surface of the Prairie-du-Chien. Flows can be reversed resulting in a net downward transfer of flow into the underlying Jordan aquifer (natural flow is upward)
3. Ditch & stream incision	Interrupts interflow patterns and lowers groundwater levels in the peat
4. Filling	Interrupts interflow patterns and characteristics

Table 2 Ecological changes from hydrological modification

1. Gradual invasion of woody species
2. Increase in rank, common wetland species
3. Net loss in peat. High evapotranspiration due to shrubs, aeration of peat by shrub roots, and lower water tables result in peat drying, oxidation, and wind erosion. Shading eliminates sedge community. Decay rates of peat exceed production.
4. Degradation of fen vegetation and associated rare species. Reduction of biological diversity and heterogeneity
5. Major shifts in faunal composition, particularly amphibians, reptiles, crayfish, aquatic insects and other invertebrates
6. Alteration of stream characteristics: flow, temperature, chemistry

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Action 4.1 Conduct an investigation of the hydrology of the fen and supporting aquifers.

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Considerations:

Purpose - To provide sufficient information for designing appropriate fen preservation strategies

Objectives

1. Identify the aquifers directly supplying the fen.
2. Define the physical characteristics of supporting aquifer, including mode of discharge into fen (i.e. point source, diffused).
3. Identify the responses of the supporting aquifers to existing stresses, including area of impact.
4. Establish the relationship of water table conditions in the fen cover types to the dynamics of the supporting aquifers.
5. Map peat stratigraphy, describe hydrological characteristics of the strata, and identify interflow patterns.
6. Prepare a water budget for the fen cover types.
7. Identify vegetation - hydrology relationships.

B. Surface Water Hydrology

Human caused modifications of the natural surface water drainage in the SNA include:

1. increasing the drainage area of the creek by stormwater diversion
2. ditching for agricultural and municipal purposes
3. filling for development

The City of Burnsville has easements to discharge stormwater into both the creek and the former municipal ditch. Burnsville has agreed to relinquish its rights to the ditch when plans for the Astleford Development are completed and construction of storm sewers directs drainage of this development to the west and north.

The Metropolitan Surface Water Management Act (MS 473.875-473.883) requires a watershed management plan be prepared for all metropolitan watersheds by December 31, 1985. One of the primary purposes of these plans is "to protect and enhance fish and wildlife habitat and recreational facilities." The SNA is located in the Lower Minnesota Valley Watershed District, and the major portion of the creek's watershed is in the Black Dog Lake Watershed District.

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Action 4.2 Participate in the preparation of watershed management plans for both districts.

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Considerations:

Lead Organizations - City of Burnsville: Black Dog Lake Watershed District  
- Lower MN Valley Watershed Management  
Organization: Lower MN Valley Watershed District

Concerns - Changes in water quality and quantity in the creek, any modifications of drainage patterns that would affect the SNA

Participation - Establish water quality and quantity standards for the SNA, describe any existing or potential watershed problems affecting the SNA, identify alternatives and modifications.

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Action 4.3 Fill or plug the former municipal ditch.

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Considerations:

Justification - This ditch lowers water table levels in the adjacent fen habitat resulting in degradation of that plant community and associated rare plants.

Phase I - Plug the ditch. At present there is no conflict with the city easement because there is no discharge into the ditch. This action would restore more natural water table conditions in surrounding fen areas. This action would require approval by the adjacent landowner.

Phase II - Fill the ditch. Contingent on the city releasing their easement on the ditch and requires approval of the adjacent landowner. Filling the ditch with former spoils would better restore interflow patterns in the peat than just plugging it. This is more important if the supplying aquifer is found to have specific discharge points that were disrupted by the ditch.



## Section 5

### ADDITIONAL INVENTORY NEEDS

The floral inventory of Black Dog Preserve SNA is not complete. Only the Fen A and B cover types have been adequately inventoried. In addition no systematic inventory of Black Dog's faunal groups have been done.

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Action 5.1 Complete the floral inventory.

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Action 5.2 Systematically survey the fauna of Black Dog Preserve SNA.

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#### Considerations:

Priorities - Invertebrate groups that are potentially dependent on specific host plants or environmental conditions restricted to the SNA.

## Section 6

### ADJACENT LANDS (See Figs 4 and 16, in Resource Inventory)

Lands adjacent the Black Dog Preserve SNA may be important to the protection and management of the SNA if:

1. its vegetation is contiguous and of a quality similar to that being protected on the SNA,
2. it contains significant natural features
3. development would restrict SNA management activities, or
4. use or development would have a strong visual, noise, or other environmental or recreational impact on the SNA.

#### A. Minnesota Valley National Wildlife Refuge

Quality: A portion of the (SE MN) Mesic Blacksoil Prairie being protected on the SNA extends across the northern SNA boundary onto Refuge land. This prairie type is considered state endangered. Its quality on the Refuge land is similar to that on the SNA and merits equal protection.

Threat: None at present. All the land north of the SNA is included in the Black Dog Unit of the Refuge. This property is owned by Northern States Power Company and leased to the FWS for management. The management theme for the Black Dog unit is to "enhance wildlife and habitat, and encourage a limited amount of public use and enjoyment of that wildlife". Specific habitat management and development activities are outlined in the Unit Management Plan - Black Dog Lake Unit, completed by the FWS, February, 1984.

Relationship to the SNA: The FWS will designate the mesic prairie on their property adjacent the SNA as a Research Natural Area or Public Use - Research Natural Area. The DNR and FWS will manage the prairie cooperatively as one natural feature. This management plan will serve as the "coordination plan" establishing management objectives and strategies for the prairie. Enforcement will continue to be the responsibility of both agencies for their respective properties.

Native grassland plantings proposed by the FWS for the Black Dog Unit will use local seed sources to minimize any potential impact on the genetic stock of the existing prairie vegetation.

The DNR will provide access to the Black Dog Unit of the Refuge via a pedestrian trail (see Action 2.1).

#### B. Astleford Property - Undeveloped

Quality: This property is occupied by fen vegetation. Fens are state endangered. Many of the associated rare species also occur within this property. The fen habitat is contiguous and part of the same feature being protected on the SNA.

Threat: This area may potentially be developed at some time in the future.

Relationship to the SNA: The fen on this property is an extension of the same

feature on the SNA. It provides additional acreage of this high priority community type and associated rare species. Preservation of the property would complement protection and management efforts on the SNA. Acquisition by the SNA program is not possible. The property lies within the boundaries of the Refuge. Public or private efforts to acquire this property for conservation purposes are encouraged. A cooperative agreement with the present landowner will allow for management activities such as prescribed burning, research and exotic species control

#### C. City of Burnsville Property

Quality: Except for a small triangle of land north of the city recreation fields, the city land between Cliff Rd and the railroad tracks has little or no SNA quality resources. The small triangle includes part of the fen-sloping cover type.

Threat: The city land is zoned industrial. No development plans have yet been approved for the property.

Relationship to the SNA: The SNA and MN Valley Refuge together create a coherent conservation district in an environmentally sensitive area that has limited development potential. City ownership of land along the north side of Cliff Rd., from River Ridge Boulevard to the top of the bluff provides a clear boundary and effective buffer to this area (City of Burnsville Policy Report No. 83-22). The small triangle will be managed as a part of the SNA according to a cooperative agreement between the DNR and City ( ).

#### D. Minnegasco Property

Quality: This property is occupied by shrub-carr and wet meadow vegetation on peat/muck soils. It has not been well surveyed and is divided by an 8' chain link fence.

Threat: None known.

Relationship to the SNA: The property up to the Minnegasco Road is part of the fen-sloping complex. To facilitate fire break preparation the part of the Minnegasco property between the fence and SNA boundary will be included as part of the adjacent SNA fire unit. This will minimize damage to the fen and result in safer breaks.

## Section 7

### EFFECTS OF MANAGEMENT ON SIGNIFICANT RESOURCES

#### A. Calcareous Fen

Prescribed burning will reduce shrub coverage and enhance fen vegetation. Burning will be done under high soil moisture conditions to avoid burning the peat (Action 3.1). Activities to control problem species will also reduce undesirable competition (Actions 3.6, 3.7, 3.8, 3.9, 3.10, 3.11). Hydrological studies will provide the necessary information to design strategies for protecting the fen's groundwater system (Actions 4.1, 4.2), and restore natural conditions (Action 4.3). The effects of management activities and responses of the vegetation to other environmental variables will be monitored (Actions 3.2, 3.3). Use of the highest quality fen area will be allowed by permit only (Action 1.2).

#### B. Rare Fen Annuals: (Scleria verticillata, Rhynchospora capillacea, and Triglochin palustris)

Effects of management are expected to parallel those described under A. The occurrence of these species seems to be determined by the availability of open sites for regeneration. The physical parameters of these sites and mechanisms of their occurrence have not been described. All three species are late summer bloomers. Germination phenology is unknown. The presence/absence of these species will be annually recorded (Action 3.4)

#### C. Rare Fen Perennials (Cladium mariscoides, Tofieldia glutinosa, Carex sterilis)

Effects of management are expected to parallel those described under A. Cladium and Tofieldia bloom in late July-August. Scleria is a tussock former and flowers in spring. Cladium and Tofieldia have localized occurrences and will be monitored (Action 3.5).

#### D. Prairie-Fen Species (Cyperidium candidum and Valeriana edulis)

These species are at their maximum rate of growth and flowering in late April and May. They occur both in the fen and prairie. Prescribed burning (Action 3.1) is expected to stimulate growth and flowering. Successive spring burns may result in a decrease in plant vigor and survival.

#### E. Wet and Mesic Blacksoil Prairie

Prescribed burning will reduce shrub coverage and enhance native vegetation (Action 3.1). Trail development will make maximal use of previously disturbed areas, however, approximately 600' of the trail will be located on the prairie (Action 2.1). Actions to control problem species will reduce undesirable competition (Actions 3.6, 3.8, 3.10). Control methods will be chosen which minimize any additional disturbance to these communities.

## Section 8

### 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 allow 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 degradation. 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 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 sooner than scheduled if circumstances so dictate and earlier scheduled actions will not suffer as a result.

ADMINISTRATIVE ACTIONS		Stewardship Group	Begin Immediately	Phase I	Phase II	Comments
Action 4.2	Participate in watershed planning	I	x			
Action 2.2	Develop interpretive package	II		\$1000		
Action 1.1	Contact Police Department	III		x		
OPERATIONAL ACTIONS						
Action 1.2	Post Fen-A as Restricted Area	I	\$55			10 signs @ \$3/sign + \$2.50/post
Action 2.1	Construct unit trail	I		x		Trailhead funded by FWS
Action 3.1	Conduct prescribed fires	I		x		
Action 3.2	Monitor plant communities	I		x		Ongoing, coordinate with 3.1, 3.10, 3.11
Action 3.3	Establish photopoints in Fen A	I			x	
Action 3.4	Annually survey rare fenannuals	I		x		Ongoing
Action 3.5	Count stems of rare fen perennials	I		x		Ongoing
Action 3.6	Control purple loosestrife	I		100-500		Ongoing
Action 3.7	Cut buckthorn	I		x		Ongoing
Action 3.8	Control reed canary grass	I		100-500		Ongoing
Action 3.9	Study displacement by cattail and <u>Phragmites</u>	I		x		
Action 3.10	Cut trees - Metro Sewer	I		x		
Action 3.11	Cut trees - Cliff Rd	I		x		
Action 4.1	Investigate fen hydrology	I		10,000		Some services provided by DNR Minerals and Waters

Action 4.3	Plug former municipal ditch	I	500-5000	Plugging vs. filling
Action 2.3	Post boundaries	II	50	20 posts @ \$2.50/post
Action 2.4	Post entrance sign	II	100	
Action 2.5	Post rules & regulations signs	II	11	2 signs @ \$3.00/sign + \$2.50/post
Action 5.1	Complete floral inventory	III	x	
Action 5.2	Survey fauna	III		x Survey will likely be done separately for different faunal groups.

Labor: Work crews required for Actions  
3.7, 3.8, 3.9, 3.10, 3.11, 2.3

Inventory team required for 5.2.



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