DEPARTMENT OF NATURAL RESOURCES:

Blufflands/Rochester Plateau
Subsection Forest Resource Management Planning

ADDENDUM

High Biodiversity Area Management Plan

Whitewater South Fork

Final

July 2006

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This document is on the Internet at http://www.dnr.state.mn.us/forestry/subsection. Information about the DNR Subsection Resource Management Plan process can be found at the same web address. This information is available in an alternative format upon request.

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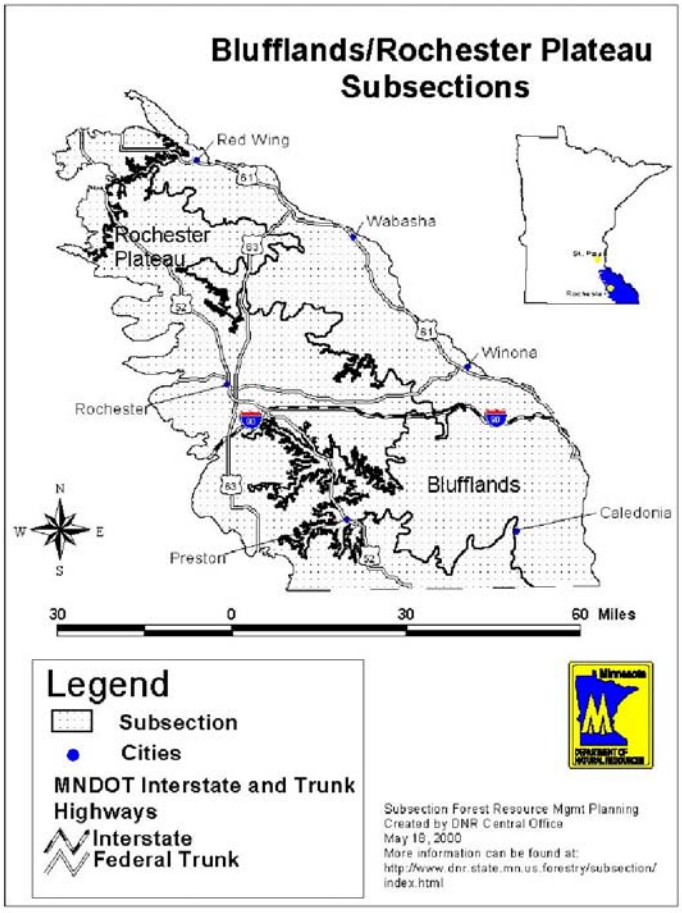
Introduction

This plan will guide management decisions and practices on state owned land in the Whitewater South Fork area (appendix 1). The Whitewater South Fork Area is one of 13 Minnesota County Biological Survey (MCBS) sites of outstanding biodiversity on lands administered by the Minnesota Department of Natural Resources (DNR) Division of Forestry, and Section of Wildlife in southeastern Minnesota. The management philosophy for this area is based on a landscape level perspective of ecosystems and the species that use these ecosystems. This plan is intended for use in conjunction with the Blufflands/ Rochester Plateau Subsection Forest Resource Management Plan (SFRMP) that was completed by the DNR in 2002, and will be revisited every seven years as part of an adaptive management process.



The Blufflands/Rochester Plateau SFRMP addressed management of vegetation on DNR Forestry- and Wildlife-administered lands. There were 13 "priority areas of significant biodiversity" identified during the process as areas requiring detailed plans that would address vegetation management and biodiversity protection needs. Most of these priority areas consist of more than one MCBS site, and in many cases these areas straddle more than one county. Of the 745 sites of biodiversity significance in the two subsections, 62 sites are contained within these thirteen priority areas. Ecological evaluations that mapped and described rare natural features were prepared by MCBS ecologists for these thirteen sites in the years 2000 through 2001. The 13 priority areas and associated information about them are listed in appendix 7.

Division directors for the DNR Divisions of Wildlife, Forestry, and Ecological Services determined that long-term management plans would be developed for the 13 identified high biodiversity areas. The division directors also provided that management of these sites should focus on the site as a whole, employ practices that perpetuate endangered, threatened, or special concern species, and native plant communities while following the mandates of forestry or wildlife administered lands.

Background & Rationale

The DNR completed the MCBS, a systematic survey of the natural areas within the Whitewater Wildlife Management Area (WWMA) in the mid-nineties. The results of this survey provide increased knowledge of the status and distribution of rare species and native plant communities. An ecological evaluation was written for this area in May 2000 to provide more detailed interpretation of the biodiversity significance of the area. The availability of this information and other existing data such as the WWMA Master Plan, Cooperative Stand Assessment (CSA) forest inventory data, and the Blufflands/Rochester Plateau SFRMP provides an opportunity to develop long-term management plans for this area that will help to manage and enhance the natural resources of this area. Thoughtful management planning in this area is of critical importance in the face of escalating development pressure in the surrounding landscape, increasing fragmentation, and global change. Recommendations in this plan are written for DNR-

administered lands. Private landowners within the project boundary will be contacted and offered management assistance for their land if they desire.

Site Description

The Whitewater South Fork Area is one of the most significant sites for native biodiversity in southeastern Minnesota. It contains one of the largest expanses of mature high-quality maple-basswood forest in the Minnesota portion of the Paleozoic Plateau. The site includes one algific talus slope and three maderate cliffs, which are communities associated with cold-air slopes and are found only in the Paleozoic Plateau. In this site these communities provide habitat for two rare snail species: the bluff vertigo (*Vertigo meramecensis)* and Hubricht's vertigo *(Vertigo hubrichti)*. Other native plant communities include northern hardwood-conifer forest, white pine-hardwood forest, oak forest, lowland hardwood forest, black ash swamp, dry cliff, and moist cliff many of these occurrences are high quality communities (see appendices 2 and 3). The Whitewater South Fork Area is one of the top ten sites for rare forest birds in southeastern Minnesota and includes occurrences of 19 listed species. These include the two snail species mentioned above, three rare bird species, and fourteen listed plant species (see appendix 6 for listing).

There is a black ash swamp occurring in a clay-lined basin in this site that appears to be unique to the Paleozoic Plateau portion of Minnesota. The swamp is characterized by concentric vegetation zones and is surrounded by a maple-basswood forest. The maple-basswood forest proceeds up the steep slopes on the north to east-facing direction. The maple-basswood forest is notable for its quality and diverse species composition. The Whitewater South Fork Area contains the largest expanse of high-quality maple-basswood forest in the Paleozoic Plateau. Several large stands are designated old-growth stands (see appendix 2). This slope and valley area has the highest concentration of rare animal and plant species and many of these are dependant on the cool moist habitat created by the above community types. The Whitewater South Fork Area also has dryer native plant communities that should be maintained through a variety of management techniques including fire and brush removal.

The Whitewater South Fork Area is one of 13 MCBS sites of outstanding biodiversity on DNR Forestry and Wildlife administered lands in southeast Minnesota and one of four high biodiversity sites located within the WWMA. Two boundaries delineate the areas of significance with this plan. The Critical Habitat Zone boundary denotes the core area of locations of rare natural features. This area encompasses 1,765 acres (1,034 acres of State-owned land). The majority of the lands in the critical zone are part of the WWMA (see appendix 2). This management plan, as stated above, guides management decisions and practices on only the State-owned lands within this boundary. The Project Boundary is 4,697 acres (2,649 acres of State Land). Here too, not all lands are state-owned and the plan only focuses on state lands. There may be opportunities however, for partnering with private landowners to protect and manage the unique resources in the area. Conservation easements, cost-share programs to establish permanent cover and management agreements might be pursued.

Long-Range Vegetation Management Goals

The long-range management goal for the area is to maintain and regenerate native plant communities and the biodiversity of the area using processes that mimic the natural disturbances that helped to maintain and establish these communities. This plan will meld the goals of biodiversity enhancement, game management, and recreation into an adaptive management process. Management goals and recommendations will be based on current management knowledge and be directed by Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines. These recommendations may change as more information from research and monitoring becomes available.

Implementation

This section is organized by major native plant community type (see appendices 2 and 6). Management objectives are identified for each community type within the area. Short-term management directives are also identified for most of the community types and include management activities that will take place over the next seven years. This plan will be reviewed as part of an adaptive management process during the DNR SFRMP process every seven years.

As noted earlier, the Whitewater South Fork Area has a variety of rare species and community types. Management in these areas will be performed in a manner that mimics natural disturbance processes and is sensitive to the maintenance of the native plant communities and the species found within these communities. The Whitewater South Fork landscape is a mix of closed canopy-moist upland and lowland forest, and dryer woodland and prairie communities. The goal for this area is to maintain the mix of community types providing a variety of habitat for numerous rare species. Any logging used in the management of these areas will be designed to mimic natural disturbance process and will be performed in a way that minimizes soil compaction and damage to the understory species. In general, much of the harvest related management activities will take place in the northern portion of this site. This area has historically received more management focus and is an important area for wildlife management activities. The southern portion of the site provides habitat for most of the rare species found in this area and many of the more sensitive native plant communities and will be managed accordingly. Management will be performed using existing road and trail systems and the construction of new roads will be kept to a minimum.

Native Plant Communities

Oak forest (southeast section) mesic subtype

Description - These forests generally occur on north-to east-facing slopes. Dominant canopy species include one or more oak species including red oak *(Quercus rubra),* bur oak *(Quercus macrocarpa),* and white oak *(Quercus alba).* Other canopy species may include basswood *(Tilia americana),* black cherry *(Prunus serotina),* and butternut *(Juglans cinerea).* Subcanopy species can include sugar maple *(Acer saccharum),* basswood *(Tilia americana),* and ironwood *(Ostrya virginiana).* Nearly all of the oak forest in this site has been selectively logged in recent years. The exception is the oak forest in Section 14 (T107N, R10W) that is free of signs of past heavy grazing and has a diverse ground layer. These forests contribute habitat for forest birds and rare snake species.

Long-term objective - Many of the high quality mesic oak forests are succeeding to more mixed hardwood stands. These areas have sugar maple, elm, basswood, oak, and other hardwoods regenerating in the understory. Some of these areas will lend themselves well to oak regeneration through various sized timber harvests while others will convert to northern hardwood species like maple, basswood, elm, and hackberry. Opportunities to incorporate shelterwood or group selection harvests should be explored when possible. Non-game Wildlife and MCBS data will be utilized to identify critical habitat for management in small, medium, and large patches, i.e., red-shouldered hawks. Other areas of mesic oak forest are not succeeding to the more mixed hardwood forest types and are threatened by invasion of nonnative species such as buckthorn and honeysuckle. Management decisions on these areas will be designed to encourage the oak community type and may include fire and timber harvest.

Short-term management directive – Five CSA forest stands met stand selection criteria for harvest and fall in the Mesic Oak Forest plant community designated by the MCBS (see appendix 5).

The following stands may be harvested over the next seven years:

Stand # 1, T106N R9W Section 6;
Stand # 13, T106N R10W Section 1;
Stand # 4, T107N R10W Section 14;
Stand # 6, T107N R10W Section 24;
Stand # 12 T107N R10W Section 25;
Stand # 3 T107N R9W Section 30, an aspen type within oak community.

Timber management should consider small, medium, and large-scale harvests in these types to provide habitat for game and non-game species, including forest interior birds. As noted in the additional management direction provided by the division directors of DNR Forestry, Wildlife, and Ecological Services (see appendix 8), clear cuts for oak regeneration is the normal practice, efforts to apply group selection and shelterwood cuts should be applied where appropriate. Management in the mesic oak forest areas will be designed to minimize canopy loss and techniques such as group selection will be examined for their effectiveness.

Oak woodland-brushland

Description - The canopy cover is 50-70% and dominated by one or more oak species including northern pin oak *(Quercus ellipsoidalis),* and/or bur oak *(Quercus macrocarpa)*. Other canopy trees may include paper birch *(Betula papyrifera),* red oak *(Quercus rubra)* red cedar *(Juniperus virginiana),* and shagbark hickory *(Carya ovata)*. These areas exhibit a denser shrub layer and canopy cover than the oak savanna, but the understory is a mix of species found in savannas and forests.

Long-term objective: The management of these areas will be designed to encourage the maintenance of the oak woodland-brushland community and will include fire and timber harvest. Areas that are threatened by invasion of nonnative species will be managed to reduce the threat of these species. Management techniques will be designed to mimic natural disturbances such as blow downs, disease, and fire.

Short-term management directive – There are no stands meeting selection criteria over the next seven years.

Lowland hardwood forest

Description - Flat to slightly sloping valley floors along the creeks support lowland hardwood forest, dominated by bur oak *(Quercus macrocarpa)* with black willow *(Salix nigra),* sugar maple *(Acer saccharum),* basswood *(Tilia americana),* and cottonwood *(Populus deltoids).* Boxelder *(Acer negundo)* is a common subcanopy tree. High native herb diversity is present in this part of the site including nodding wild onion *(Allium cermium)*. The bottomland forests are an important component of the habitat for many forest birds that occupy the area, including the three rare bird species Acadian flycatcher *(Empidonaz virescens),* Cerulean warbler *(Dendroica cerulean),* and Louisiana waterthrush *(Seiurus motacilla).*

Long-term objective - These areas will be managed to maintain the lowland hardwood forest community type and to encourage the continued existence of the forest interior bird species that currently occupy these areas. Areas that are not threatened by reed canary grass and are regenerating the overstory hardwood species will be maintained with minimal management. Areas of lowland hardwood forest that are dominated by reed canary grass will be managed to minimize this risk. Areas that are exhibiting canopy regeneration will be managed to encourage the regeneration of overstory hardwood species and restore the lowland hardwood forest community.

Short-term management directive – Two stands were identified through the SFRMP process in this community for limited harvesting over the next seven years (see appendix 5).

Stand # 3, T107N R10W Section 36;
Stand # 14, T107N R10W Section 36.

These two stands have previously been selectively cut for walnut and, upon field review a selective harvest may be conducted over the next seven years. Management will be determined based on current condition, exotic species cover, and other threats to the lowland forest system. Stands that are not threatened by box elder conversion or invasion of exotics species will not be managed with harvest.

Maple-basswood forest

Description - The maple-basswood forest in this site is notable for its quality and extent. Dominated mostly by sugar maple, basswood, and red oak occur on steep, north-facing slopes within the site. At the tops of the slopes, the stands grade into mesic oak forest dominated principally by red oak. These are mature stands with highly diverse assemblages of plant species, including numerous spring ephemerals. Seven of the fourteen rare plants species in the site were documented in this forest type including Moschatel *(Adoxa moschatellina),* Golden-seal, and nodding wild onion *(Allium cermium).*

Long-term objective - These areas will be managed to maintain the maple basswood forest community and the full canopy cover that is typical of this native plant community. Harvest activity should limit canopy gap creation wherever possible and account for fill in by remaining crowns. Seasonal and equipment restrictions should be used to limit soil disturbance. In the Whitewater South Fork Area, maple-basswood plant communities are found on steep slope and the soils and understory species found in these communities are sensitive to disturbance. Areas should be monitored for nonnative species invasion. Where nonnative species invasion is prevalent management action should be taken. Field visits will be performed to determine best management for any stands listed in the short-term management directive.

Short-term management directive – Harvest planned in this community type will follow the additional management guidance provided by the division directors of DNR Forestry, Wildlife, and Ecological Services (see appendix 8).

Old growth stands are located in:
Stands # 2,3,6,10, & 11, T106N R10W Section 1. No management actions will be implemented here.

White pine-hardwood forest

Description - The stands occur on dry to wet-mesic sites, mostly as narrow bands. White pine *(Pinus strobes)* is present as a dominant canopy or super canopy tree and varies from scattered to dense cover. The composition of these stands varies with site moisture, ranging from stands co-dominated by red oak, basswood, sugar maple and white oak in mesic to dry-mesic sites, to dryer sites with bur oak and northern pin oak. Many plants typical of mesic hardwood forests are found in these stands. These plant communities are associated with maderate cliffs and there may be additional northern-hardwood conifer forests associated with other cold air slopes in the site. Several include all size classes of white pine, indicating regeneration is occurring successfully. Some of the driest slopes in the site have small dry prairies associated with the white pines.

Long-term objective - The management goal for this area is to maintain the white pine-hardwood forest plant community. These areas are sensitive to loss of canopy cover that results from timber harvests. In order to maintain this community type, areas should be monitored for white pine regeneration. Those areas that exhibit white pine regeneration should be allowed to continue natural regeneration. Those areas that exhibit a lack of white pine regeneration should be managed to encourage white pine regeneration. This management may include some form of scarification or logging to encourage white pine regeneration. Any management in this area should be conducted in a manor that is sensitive to the needs for the community as a whole.

Short-term management directive – The white pine-hardwood forest community contains one CSA stand that met harvest criteria during the next seven years, stand # 7 (oak), T107N R10W Section 36. Harvest in this community will follow the additional management guidance provided by the division directors of DNR Forestry, Wildlife, and Ecological Services (see appendix 8). Because this particular community did not have an extensive MCBS inventory conducted, it is recommended that a thorough ground survey be conducted by staff from the Divisions of Ecological Services, Forestry and Wildlife prior to any timber harvest to detail plans for ensuring retention of this unique community. Opportunities to encourage white pine regeneration will be explored while maintaining a healthy oak component in this type. In addition, should a timber harvest be proposed, only a portion of the community will be harvested to better monitor impacts on ground cover and any subsequent white pine regeneration within this type.

Old growth stands are located in a portion of Stand # 2, T107N R10W Section 26, and Stand # 2, T107N R10W Section 36. No harvesting activity will take place in the old growth areas.

Northern hardwood-conifer forest

Description - These native plant communities occur on the steepest (70 –80 %) slopes in the site and are extremely rare in southeast Minnesota. They are mesic to wet-mesic forests on north-facing bluffs, with a canopy of yellow birch, white pine *(Pinus strobes)*, sugar maple, basswood, and red oak. The ground layer includes a diversity of herbaceous species. These communities occur on cool, steep north-facing slopes and include several plant species generally found much further north. Canada *yew (Taxus Canadensis)* is found in most of these pine stands that also have other species rarely seen in southeastern Minnesota, including yellow birch *(Betula alleghaniensis)* and twisted stalk *(Streptopus roseus)*. These northern hardwood-conifer forest are associated with maderate cliffs.

Long-term objective - The management goal for this area is to maintain the northern hardwood-conifer forest plant community. These areas are sensitive to loss of canopy cover that results from timber harvests. These areas will be managed to maintain the northern hardwood-conifer forest community and the full canopy cover that is typical of this native plant community. In the Whitewater South Fork Area, northern hardwood-conifer plant communities are found on steep slope and the soils and understory species found in these communities are sensitive to disturbance. Areas should be monitored for nonnative species invasion. Where nonnative species invasion is prevalent management action should be taken.

Short-term management directive - No activities are planned during the next seven years.

Talus slope (algific subtype) and moist cliff (southeast section) maderate subtype

Description - These communities occur on north-facing exposures. These two kinds of features have unusually cold microclimates as a result of systems of fissures extending back into the bedrock layers where ice persists throughout much of the summer. Cold water and air emerge from the cliff face or talus. Algific talus slopes accumulate areas of peat as a result of cold temperatures and slow soil decomposition rates. These cold microhabitats support an unusual biota adapted to cold environments, including several

rare, disjunct plant and snail species. Pleistocene relict plant that persists on the maderate cliffs and algific talus slopes within the site. Other disjunct plant species typical of more northern distributions associated with maderate cliffs and algific talus slopes in the site include Canada yew, yellow birch, and mountain maple *(Acer spicatum)*. Species of land snails have been identified on the algific talus slopes, including locations for two Pleistocene relict species listed as rare in Minnesota these include Bluff vertigo and Hubricht's vertigo *(Vertigo hubrichti)*.

Long-term management objectives - Maintain and protect the sensitive habitat of these areas. Avoid management activities that would threaten these areas. Include buffers between adjacent sites when management is implemented.

Short-term management directives - No activities planned during the next seven years.

Dry cliffs (southeast section)

Description - Numerous, small-disturbed dry cliffs of dolomite and sandstone occur on south-facing slopes throughout the site. These cliffs are sparsely vegetated with a distinctive flora, including the rare cliff goldenrod *(Solidago sciaphila)*.

Long-term management objective - Maintain and protect these habitats. Avoid management activities that would threaten these areas.

Short-term management directive - No activities planned during the next seven years.

Dry prairie (southeast section) bedrock bluff prairie

Description - Occur on well-drained bedrock outcrops on the uppermost parts of steep south-facing slopes and narrow ridge tops. These bluff prairies are dominated mostly by sideoats grama *(Bouteloua curtipendula)*, little bluestem *(Schizachyrium scoparium)*, and plains muhly *(Muhlenbergia cuspidate)*. Big bluestem *(Andropogon gerardii)* often dominates in small areas of deeper soils. A diverse set of shrubs are scattered in these prairies, including leadplant *(amorpha canescens)*, ninebark *(Physocarpus opulifolius)*, and prairie willow *(Salix humilis)*. Species diversity in these prairies is generally high. Timber rattlesnakes *(Crotalus horridius)*, is a State threatened species and has been documented on a south-facing bluff above the South Fork River.

Long-term management objective - These areas will be maintained with periodic fire and brush cutting to control woody competition. Field visits will be performed to determine best management for any stands listed in the short-term management directive.

Short-term management directive - Continue to maintain the Bedrock bluff prairie communities in the Whitewater South Fork Area through prescribed burning to renovate and increase bluff prairie acreage in this area.

Moist cliff (southeast section)

Description - These plant communities are moist to wet communities on exposed north- to east-facing dolomite or sandstone cliffs and on well-shaded south- to wets-facing cliffs. Mosses, liverworts, and lichens are common. Vascular plants include bulblet fern *(Cystopteris bulbifera)* and slender cliff-brake *(Cryptogramma stelleri)*.

Long-term management objectives - Maintain and protect the sensitive habitat of these areas. Avoid management activities that would threaten these areas. Include buffers between adjacent sites when management is implemented.

Short-term management directives - No activities planned during the next seven years.

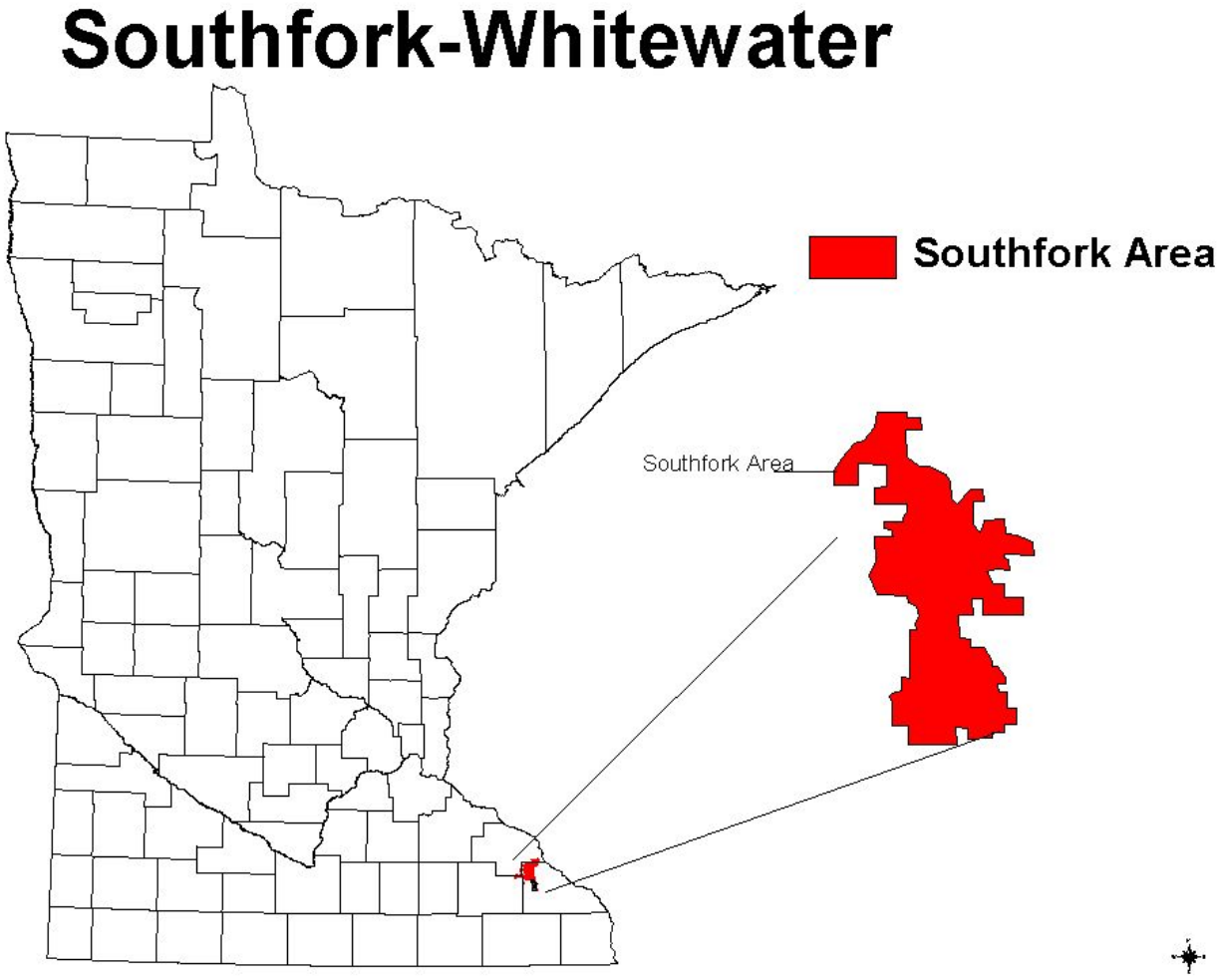
Black ash swamp

Description - These communities are lowland forests on organic soil in clay-lined basins on glacial till. The soils are continuously saturated. The outer rims of basins are dominated by black ash *(Fraxinus nigra)* and the interior by distinct zones of emergent herbaceous vegetation. The black ash swamp in this site occurs on clay-lined basin and provides habitat for the only known occurrence of the rare blunt-lobed grapefern *(Botrychium oneidense)* in the Paleozoic Plateau.

Long-term management objectives - These areas will be managed to maintain the black ash swamp community and the canopy cover and emergent vegetation that is typical of this native plant community. In the South fork area the black ash swamp plant communities is found on the valley floor and the soils and understory species found in this community are sensitive to disturbance. Areas should be monitored for nonnative species invasion. Where nonnative species invasion is prevalent management action should be taken.

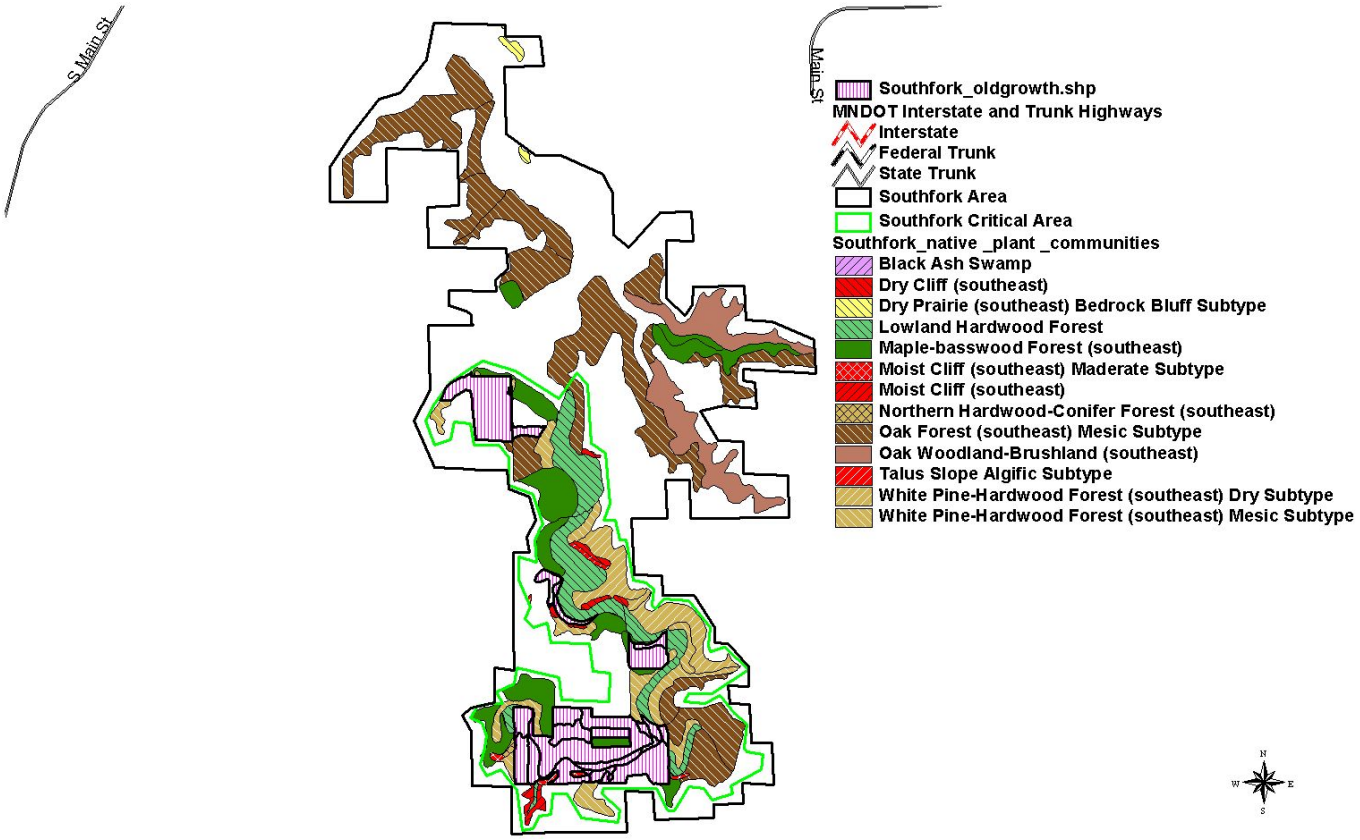
Short-term management directives - No activities planned during the next seven years.

Appendix 1: Whitewater South Fork Project Area Location

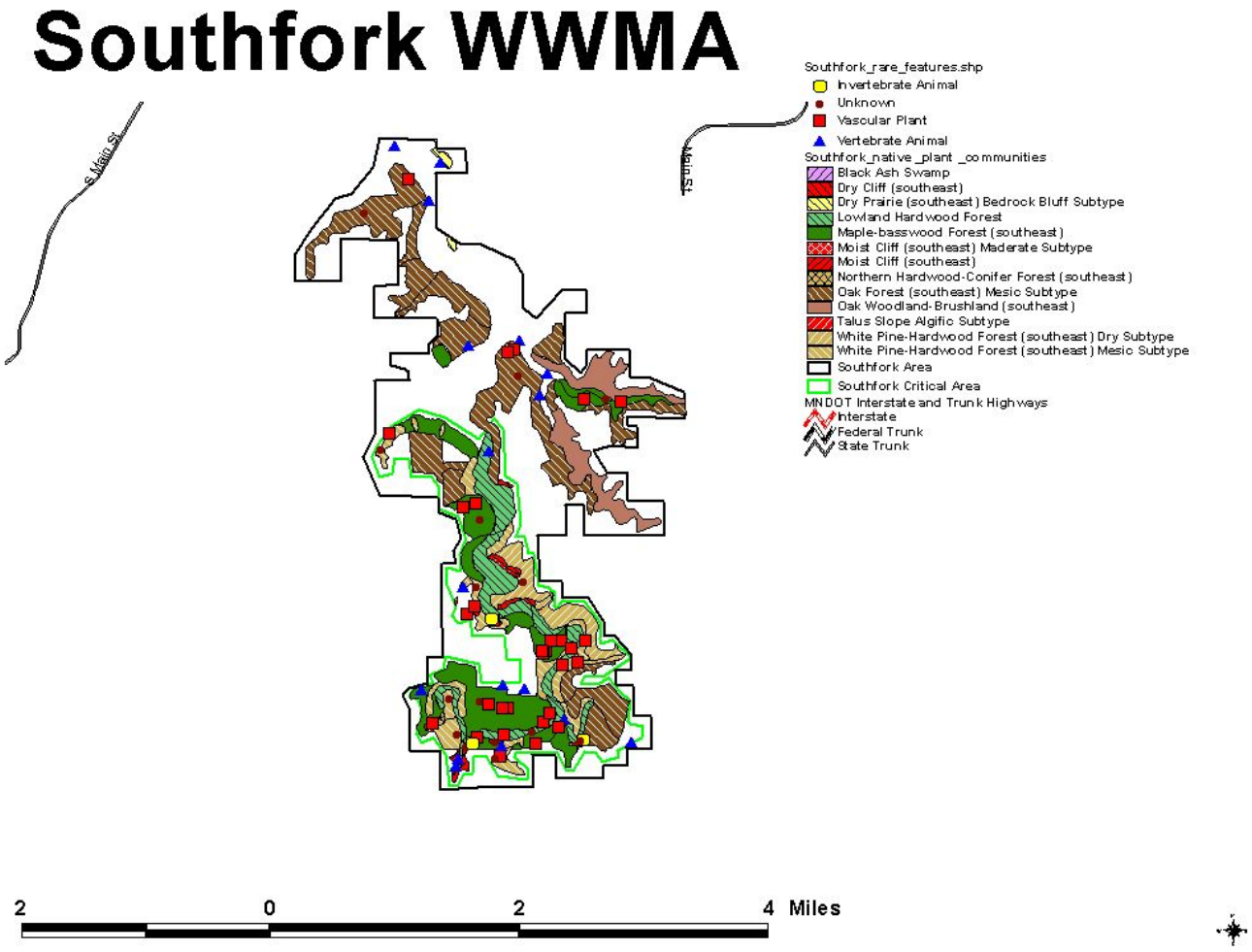


Appendix 2: Native Plant Communities & Old Growth Stands

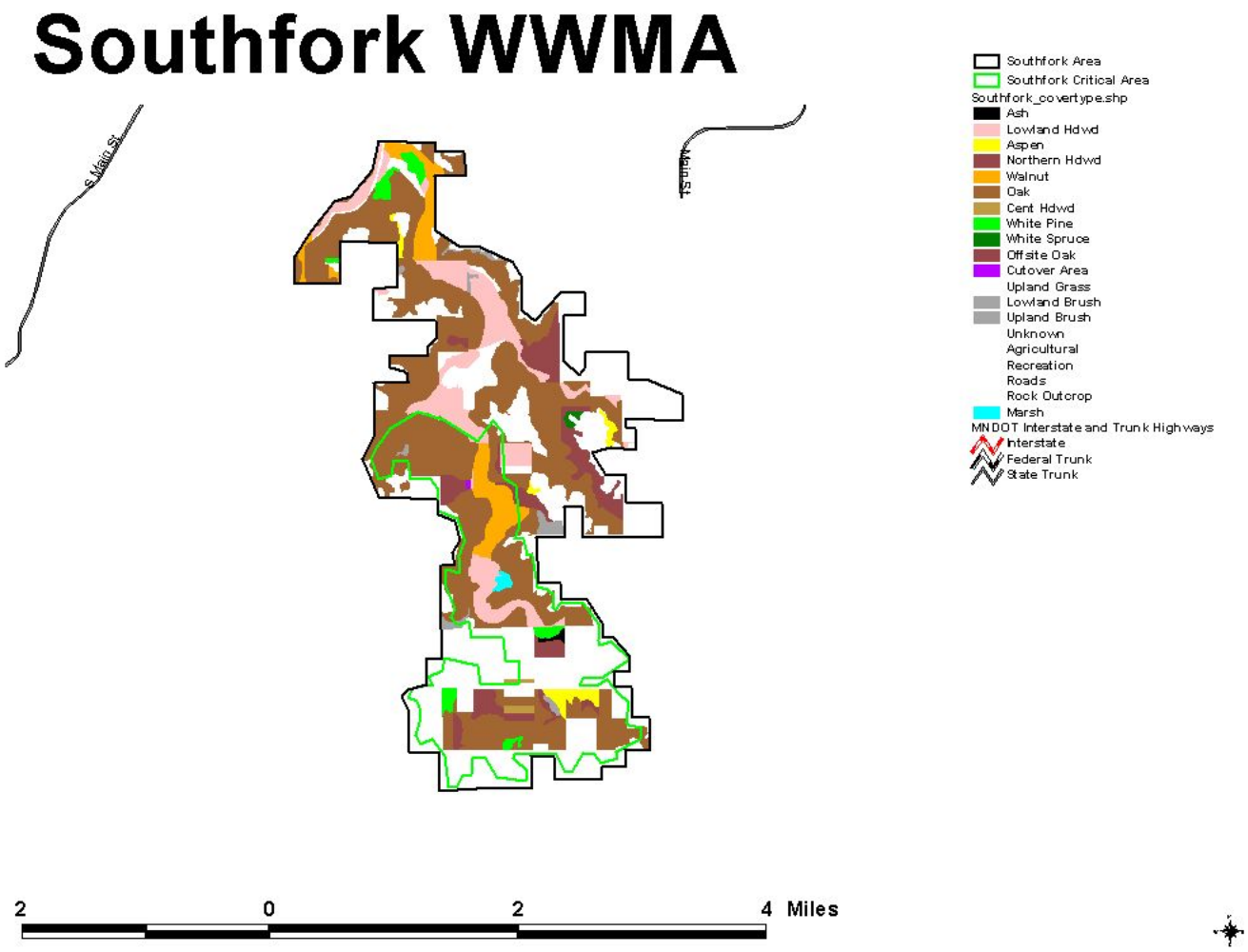
Southfork WWMA



Appendix 3: Native Plant Communities & Rare Elements

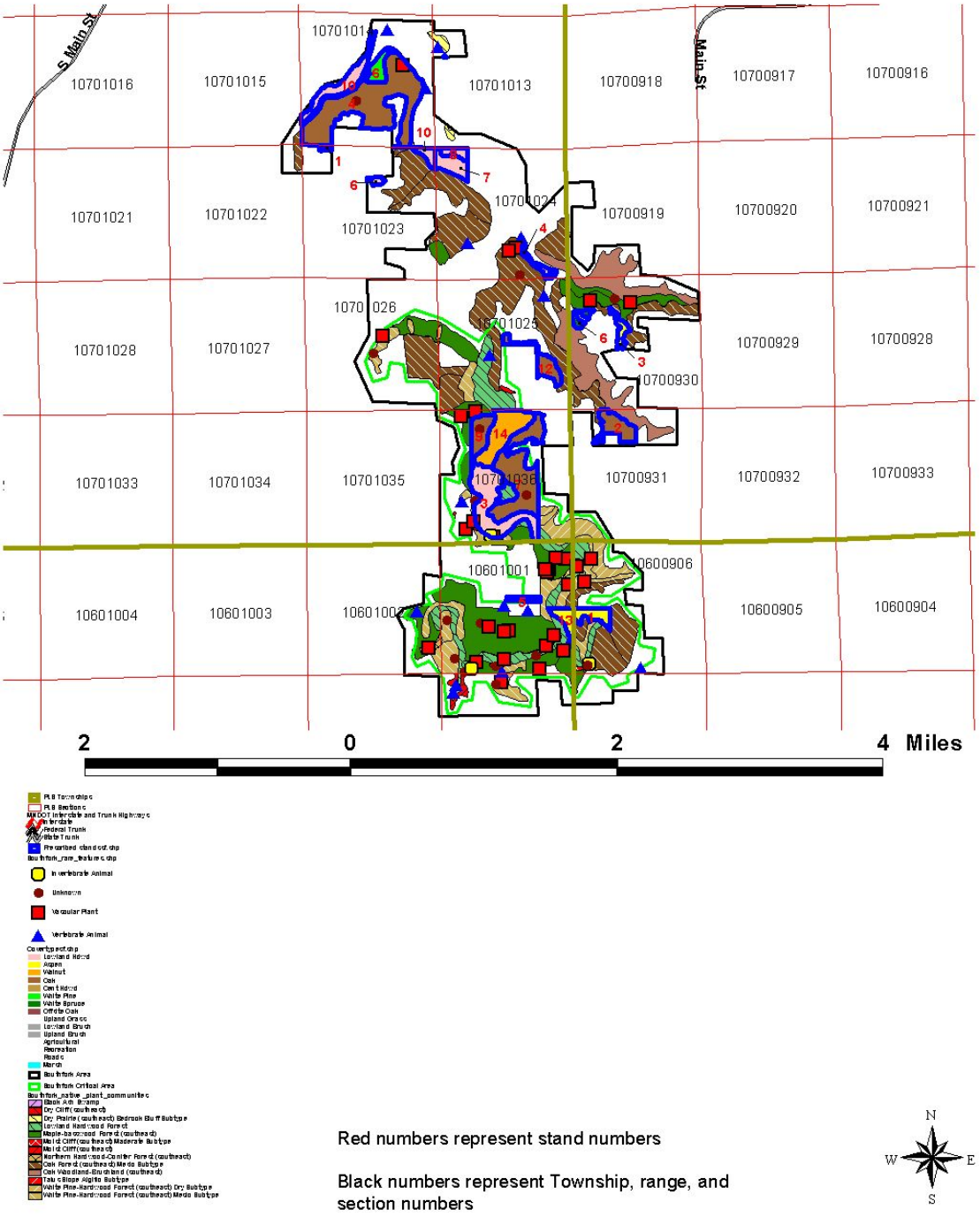


Appendix 4: Cooperative Stand Assessment Cover Types



Appendix 5: Stands Selected for Management Review[1]

Southfork WWMA



[1] Stands selected for vegetation management are outlined in blue on the map.

Table 1. Stands within the Evaluation Project Boundary that meet SFRMP and MCBS Plant Community Criteria and are potential candidates for vegetation management during next seven years.

Township	Range	Section	Stand/Acres	Action
106	9	6	1/17	Harvest- Even Age(aspen)
106	10	1	13/14	Harvest-Even Age(aspen)
107	9	30	3/10	Harvest-Even Age(aspen)
107	10	14	4/188	Group Selection
107	10	25	2/3	Selective Harvest
107	10	36	3/76	Selective Harvest
107	10	36	7/101	White Pine Regeneration
107	10	36	14/54	Selective Harvest

Table 2. Stands within the Evaluation Project Boundary that met SFRMP criteria (but not MCBS plant community criteria) and are potential candidates for vegetation management over the next seven years.

Township	Range	Section	Stand/Acres	Action
106	10	1	5/5	Stand has been selected to have some harvest activity based on multi-disciplinary review.
107	9	30	6/7	“ ”
107	9	31	2/28	“ ”
107	10	14	10/38	“ ”
107	10	22	2/6	“ ”
107	10	23	6/8	“ ”
107	10	23	10/8	“ ”
107	10	24	4/8	“ ”
107	10	24	7/22	“ ”
107	10	24	8/8	“ ”
107	10	25	12/22	Group/Selective Harvest

Appendix 6: Rare Features Summary – South Fork Area

Native Plant Communities	**EO-Rank[1]**
Black Ash Swamp	B
Dry cliff (Southeast Section)	
Dry Prairie (Southeast Section) Bedrock Bluff Subtype	
Lowland Hardwood Forest	B
Maple-basswood Forest (Southeast Section)	AB, B
Moist Cliff (Southeast Section Maderate Subtype	B, C
Moist Cliff (Southeast Section)	
Northern Hardwood-conifer Forest (Southeast Section)	A
Oak Forest (Southeast Section) Mesic Subtype	**B, C**
Oak Woodland-brushland (Southeast Section)	
Talus Slope (Algific Subtype)	BC
White Pine-Hardwood Forest (Southeast Section) Dry subtype	
White Pine-Hardwood Forest (Southeast Section) Mesic subtype	A, **B**

Rare Plants	**Status**
Botrychium oneidense (blunt-lobed grapefern)-1	**E**
Hydrastis canadensis (goldenseal)-15	**E**
Allium cernuum (nodding wild onion)-74	**THR**
Aster shortii (Short's aster)-27	**THR**
Carex Laevivaginata (smooth-sheathed sedge)-24	**THR**
Diplazium pycnocarpon (narrow-leaved spleenwort)-43	**THR**
Adoxa moschatellina (moschatel)-74	**SPC**
Carex woodii (Wood's sedge)-64	**SPC**
Dicentra Canadensis (squirrel corn)-43	**SPC**
Dryopteris goldiana (Goldie's fern)-37	**SPC**
Jeffersonia diphylla (twinleaf)-32	**SPC**
Panax quinquefolius (ginseng)-115	**SPC**
Sanicula trifoliate (black snakeroot)-38	**SPC**
Solidago sciaphila (Cliff Goldenrod)-84	**SPC**
Actaea pachypoda (white baneberry)-33	**NON**
Athyrium thelypterioides (Silvery spleenwort)-41	**NON**
Liparis lilifolia (lilia-leaved twayblade)-28	**NON**
Poa sylvestris (woodland bluegrass)-6	**NON**

Rare Animals	**Status**
Crotalus horridus (timber rattlesnake)-109	**THR**
Dendroica cerulean (Cerulean warbler)-56	**SPC**
Empidonax virescens (Acadian flycatcher)-35	**SPC**
Seiurus motacilla (Louisiana waterthrush)-46	**SPC**
Rana palustris (pickerel frog)-57	**NON**

Fish	**Status**
Lampetra appendix (American brook lamprey)-86	**NON**

Snails	**Status**
Vertigo meramecensis (Bluff vertigo)-6	**THR**
Vertigo hubrichti (Hubricht's vertigo)-10	**Unknown**

Key:

[1] ecological quality rank where A=highest quality and D=lowest quality (multiple ranks indicate multiple occurrences)

[2] number following rare species listing refers to number of occurrences recorded in the area

Appendix 7. Areas of Significant Biodiversity in the Paleozoic Plateau

The Minnesota County Biological Survey identified 745 sites of biodiversity significance in the Paleozoic Plateau Ecological Section (Blufflands and Rochester Plateau Subsections). The breakdown of sites, their biodiversity significance rankings, and the number of sites of each ranking that contain state lands administered by various DNR divisions is summarized in the following table:

Table 1. MCBS Sites in the Paleozoic Plateau

Biodiversity Significance	**Total Number of MCBS Sites**	**Percent of Total**	**Number of MCBS Sites Containing State Lands**	**Number of MCBS Sites Containing State Forest Lands**	**Number of MCBS Sites Containing State Wildlife Lands**	**Number of MCBS Sites Containing State Park Lands**	**Number of MCBS Sites Containing SNA Lands**
Outstanding	121	16	65	40	22	8	11
High	187	25	91	51	21	8	14
Moderate	437	59	159	95	23	8	2
Total	**745**	**100**	**315**	**186**	**66**	**24**	**27**

For DNR managed state lands in Minnesota, strategies for managing sites of biodiversity significance differ according to the degree of biodiversity significance, statutory restrictions on land designations, and conservation needs of species and communities within the sites. In Scientific and Natural Areas (SNAs), management is done with rare natural features protection as the highest priority. For State Parks, comprehensive planning processes address protection of biodiversity, and in some cases SNAs or Natural Areas Registry sites are designated within park boundaries. [Natural Areas Registry sites are areas of biodiversity significance on public lands, for which a memorandum of understanding (MOU) has been signed by the agency or DNR division that manages the site and by the SNA Program supervisor. This MOU contains information about the management and protection needs of the rare features in the site.] For Wildlife Management Areas (WMAs), state statutes prohibit SNA designation within WMAs. Management is addressed as part of the Subsection Forest Resource Management Planning (SFRMP) process, and in some cases Natural Areas Registry sites are designated within WMA boundaries. For State Forests, management is addressed as part of the SFRMP process, and in some cases SNAs or Natural Areas Registry sites are designated within State Forest boundaries.

The SFRMP process for the Paleozoic Plateau addressed management of vegetation on State Forest and Wildlife lands. There were 13 “priority areas of significant biodiversity” identified during the process as areas requiring detailed plans that would address vegetation management and biodiversity protection needs. Most of these priority areas consist of more than one MCBS site, and in many cases these areas straddle more than one county.

Appendix 8: Additional Management Guidance

Harvest of high quality maple-basswood communities

Selective harvest will be allowed if site teams jointly develop detailed plans that include joint on-site visits. The following conditions will apply:

- Oak resources can be salvaged as these sites are converted to purer maple basswood communities. This should be done by selective, individual or small group marking and removals.
- Harvest activity should limit canopy gap creation wherever possible and account for fill in by remaining crowns.
- Seasonal and equipment restrictions should be used to limit soil disturbance; horse logging on frozen ground should be done where appropriate in the most sensitive sites).
- Trees should be jointly marked as well as the layout for access and skid trails to minimize any additional permanent fragmentation.
- Portions of stands that support unique or rare resources (such as a rare species or a rich spring ephemeral flora) may be delineated for no harvest.
- A pre and post treatment monitoring and evaluation protocol for species and communities of concern (both native and exotic) should be developed and implemented in each stand. Harvest plans should also take into account whether or not invasive exotic species occur in stands immediately adjacent to those being harvested.

With respect to the last bullet, Ecological Services staff will continue discussions with USDA Forest Service staff to further explore the opportunities to collect pre-treatment data during the 2004 field season.

Mesic oak communities and oak regeneration

The mesic oak communities should be managed. The benefits of an oak component to wildlife species, particularly game species, are important. These stand types should be individually examined, selecting those with the greatest chance to regenerate oak to actively manage through timber harvest and other silviculture techniques. Those with advanced maple-basswood regeneration should be allowed to succeed to more shade tolerant northern hardwoods. Subsection timber management plans should consider small, medium, and large-scale harvests in these types to provide habitat for game and non-game species, including forest interior birds.

A variety of types of harvests and other silvicultural practices should be practiced as well. Clear-cuts are the norm to regenerate oak in southeastern Minnesota, but efforts to apply group selection and shelterwood cuts should be applied where appropriate. Group selection creates a feathered edge effect that is far different than that created by cutting next to an open agricultural field and mimics those natural blowdowns that occurred in 1998 in the southeast. Look for opportunities to clear-cut the steeper portions of the forested type while scarifying the soil pre-sale. Shelterwood or group selection harvest should be applied on the more level terrain.

Prescribed fire should also promote oak regeneration, either prior to or after a sale in an attempt to reduce shade tolerant competition. Through the use of this tool, we may be able to reduce our pre- and post-sale chemical treatments. The highest quality biodiversity sites for recreation will receive the highest priority for prescribed fire funding. Wildlife will work with the Divisions of Ecological Services and Forestry to ensure that these sites are regenerated through the application of fire.

Aspen and white pine pockets

The cover type goal as listed in the Blufflands/Rochester Plateau Subsection Forest Resource Management Plan is to maintain or moderately increase the white pine acreage and increase the aspen acreage for various wildlife and non-game species. As stated in the plan, there are relatively few stands of aspen larger than five-acres in size in southeastern Minnesota.

Native white pine stands are limited in number, but provide multiple benefits to numerous game and non-game species from roosting sites for wild turkeys to perches and roost areas for bald eagles. The department believes it is necessary to access some of the sites for management to ensure natural regeneration occurs.

Options to minimize any intrusion through the maple-basswood communities should include the following:

- A search for any pre-existing old homestead roads or trails that could be used for access and whether exotic species are present in the area which might be introduced along such a corridor if made active again;
- List alternate means to access the white pine such as through private land, through other disturbed communities, etc; and
- Timing of access whereby any mechanical scarification would take place during fall or early winter, reducing the "footprint" upon the trail used to access such stands. The department believes such efforts to maintain or increase the native white pine acreage in this landscape outweigh the minor impacts to surrounding northern hardwood communities.

Small aspen clones in high quality sites should only be harvested when a harvest is already planned and approved by the team, at the same time, within the immediately surrounding stand in which the clone is embedded. Other conditions mentioned under the high quality maple-basswood communities section above should also be addressed. If harvest in the stand in which the aspen is embedded is not planned, then a special effort to cut the aspen should not be made.