

DEPARTMENT OF NATURAL RESOURCES:

Blufflands/Rochester Plateau
Subsection Forest Resource Management Planning

ADDENDUM

High Biodiversity Area Management Plan

Whitewater Sand Savanna

Final

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Introduction

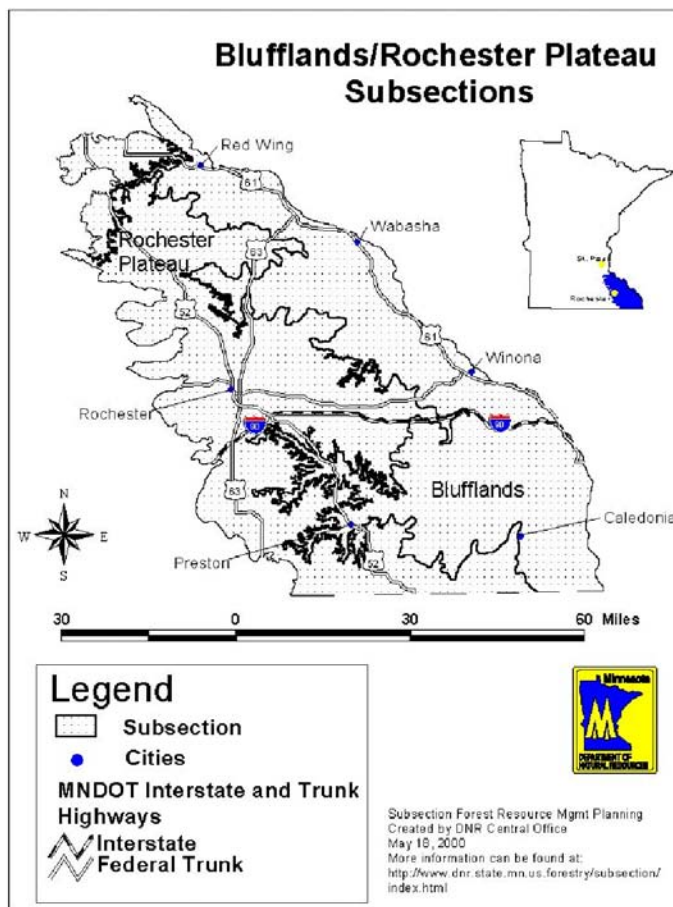
This plan will guide management decisions and practices on state owned land in the Whitewater Sand Savanna area (Appendix 1). The Whitewater Sand Savanna Area is one of 13 MCBS sites of outstanding biodiversity on lands administered by the DNR Division of Forestry, and Section of Wildlife in southeastern 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 to be used 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 7-years as part of an adaptive management process.

The Blufflands/Rochester Plateau SFRMP 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. 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 thirteen 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 Minnesota Department of Natural Resources (MNDNR) completed the Minnesota County Biological Survey (MCBS), a systematic survey of the natural areas within the Whitewater Wildlife Management Area (WWMA) in the mid-nineties (Appendix 2). 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, Minnesota County Biological Survey, 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.

Site Description

The Whitewater Sand Savanna Area can be divided into three ecological units: terrace, bluff, and floodplain (Appendix 3). This area incorporates a variety of native plant communities and the large integrated landscape provides habitat for a variety of rare species. The terrace unit exists in areas of Plainfield Sand on terraces above the Whitewater River and consists of barrens oak savanna, jack pine barrens, barrens sand prairie, small areas of white pine-hardwood forests, and dry oak forest. The bluff unit exists on the slopes above the terrace unit and the floodplain unit. This area consists of bedrock bluff prairies, oak forests, oak woodland-brushland, and small areas of mesic prairie. The floodplain unit exists along the Whitewater River and consists of floodplain forests, and small areas of wet meadows. A description of these communities and the Endangered, Threatened and Special Concern Species that occur within them will follow in the implementation section of this management plan.

The Whitewater Sand Savanna Area is one of 13 MCBS sites of outstanding biodiversity on State Wildlife and Forestry lands in southeast Minnesota and one of 4 high biodiversity sites located within the WWMA. Two boundaries delineate the areas of significance addressed by this plan and are shown on the maps in appendices 2-5. The Critical Habitat Zone boundary denotes the core area of locations of rare natural features. This area encompasses 5,975 acres (5,613 acres of State Land). The vast majority of the lands in the critical zone are part of the WWMA. This management plan, as stated above, guides management decisions and practices on only the state-owned lands within this boundary. The Project Boundary is 12,797 acres (11,015 acres of State Land) and refers to a larger area that would allow for additional habitat and buffering. 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 manage and enhance native plant communities and the plant and animal species that reside in this area using processes that mimic the disturbances processes that helped to establish and maintain these communities. This plan will meld the goals of biodiversity protection, game species 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 ecological unit and then by major native plant community types that occur in the area. Management objectives are identified for each community type within the ecological unit. 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 Blufflands/Rochester Plateau SFRMP process every seven years.

The Whitewater Sand Savanna Area has a variety of rare species and community types (Appendix 6). 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 Sand Savanna landscape is a mix of closed canopy upland and lowland forest, and open savanna 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. Management will be performed using existing road and trail systems and the construction of new roads will be kept to a minimum.

The majority of the Whitewater Sand Savanna Area is a mix of oak forest, oak woodland-brushland, jack pine barrens, and dry oak savanna. Areas will continue to be burned with an emphasis on enlarging the burn area to encourage expansion of the oak savanna in the dryer oak brushland and oak forest communities-particularly those areas of Plainfield Sand soils. This management will focus on three areas, two of which are adjacent to occupied Karner blue butterfly habitat (Historic and Cuthrell Valleys as identified under the Karner blue management plan written by Cynthia Lane (1994)). The third is located in Section 1, Whitewater Township (Lupine Valley). Management will include, selective cutting and girdling of trees, herbicide application to create patchy openings, firewood sales, as well as prescribed fire. Turkey Valley and Fabel Ravine will be considered for future savanna restoration work since active management within occupied Karner Blue sites may be limited due to their Federally Endangered Status. Management techniques will be designed to mimic natural disturbances such as blow downs, diseases native to the area, and fire. Non-game wildlife and area wildlife managers currently cooperatively manage much of this area. Management of this area is largely based on recommendations outlined by Cynthia Lane (1998). Approximately 500 acres of the Sand Savanna area, located just northeast of the old town site of Beaver, is a SNA Natural Registry Site (Appendix 4). Habitat Management will continue to follow a Memorandum of Understanding providing input and considerations from SNA personnel (Appendix 8).

Terrace Unit

Occupies an area from the bluffs to the floodplain of the Whitewater River below. This unit includes the jack pine barrens, barrens oak savanna, barrens sand prairie, and white pine hardwood forest community types. The oak barrens, prairie, and jack pine barrens communities provide habitat for numerous rare species. The endangered Karner blue (*Lycaeides melissa samuelis*) and persius dusky wing (*Erynnis persius*) butterflies require the sand savanna habitat and lupine (*Lupinus perennis*) that occurs within this disturbance dependant habitat. The barrens also provide nesting habitat for the state-listed Blanding's turtle (*Emydoidea blandingii*). Seven listed plants occur in the barrens including the endangered rough-seeded flameflower (*Talinum rugospermum*) and the threatened fernleaf false foxglove (*Aureolaria pedicularia*). The white pine-hardwood upland forest provides important habitat for three special concern species (acadian flycatcher (*Empidonax vireescens*), cerulean warbler (*Dendroica cerulea*), and red-shouldered hawk (*Buteo lineatus*)) that require forest interior habitat.

Jack Pine Barrens

Description - This area represents the largest jack pine barrens in southeast Minnesota. These communities have a canopy cover of 10-70% and jack pine (*Pinus banksiana*) is the dominate tree species. The shrub layer is typically patchy and the ground layer is dominated by dry prairie species. A number of steep open sand prairies occur within the jack pine barrens community. Jack pine barrens are located adjacent to an occupied Karner blue butterfly site (Historic) in Section 14, T108N R10W. The butterflies are located in a small barrens dry prairie within the jack pine barrens. Exotic species including Tartarian honeysuckle and buckthorn have moved into this area. And, white-tailed deer have greatly reduced jack pine seedling survival due to browsing. Management activities that open the habitat and encourage the reproduction of Jack Pine are on going in this area.

Long-term objective - The management goal for this area is to enhance the jack pine barrens communities in the area while being sensitive to the Karner blue butterfly population. Management activities that open the habitat and encourage the reproduction of Jack Pine are on going in this area and should continue. Current work to expand Karner blue butterfly habitat will continue with creating a patchwork of open savanna adjacent to the occupied areas. Management treatments may include, commercial firewood sales or other timber sales, girdling and herbicide application, scarification, and prescribed burning.

Short-term management directive - Continue the current management through the use of prescribed fire on habitat adjacent to wetlands, mesic prairies, bluff prairies, and barren oak savanna with reference to both the Natural Heritage Registry agreement and the recommendations of the Karner Blue Recovery Plan. Continue management to maintain and enhance the oak savanna habitat and Jack Pine Barrens based on current management practices and Karner Blue butterfly recovery plan in the areas identified in this plan. This will include selective cutting, girdling and chemical application to create a patchy habitat. Expand Karner blue habitat work into the jack pine barrens community to eliminate competing oak and release jack pine. Conduct a large scale prescribed burn throughout the entire Natural Heritage Registry site excluding the occupied Karner blue butterfly site within four years.

Dry prairie (barrens subtype)

Description - These communities occur scattered with in the jack pine barrens and barrens oak savanna communities on very steep slopes, that are somewhat different from the surrounding savanna areas. The dominant grass species in these communities typically include: little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), and Junegrass (*Koeleria macrantha*). The common forb species include: horsemint (*Monarda punctata*), wild lupine (*Lupinus perennis*), tall wormwood (*Artemisia campestris*), and Hairy puccoon (*Lithospermum caroliniense*). The federally endangered Karner blue butterfly is located in small patches of these prairies within the jack pine barrens.

Long-term management objective - The management goal for this area is to enhance the dry prairie communities in the area while being sensitive to the Karner blue butterfly population. Management activities that open the habitat are on going in this area and should continue. Current work to expand Karner blue butterfly habitat will continue with creating a patchwork of open savanna adjacent to the occupied areas.

Short-term management directive - Continue the current management through the use of prescribed fire and brush removal with reference to both the Natural Heritage Registry agreement and the recommendations of the Karner Blue Recovery Plan. Continue management to maintain and enhance the oak savanna habitat based on current management practices and Karner Blue butterfly recovery plan in the areas identified in this plan.

Barrens oak savanna

Description - Barren oak savanna occur on Plainfield Sand on river terraces. The canopy cover is 10-70% and dominated by black oak (*Quercus velutina*). Other canopy trees can include northern pin oak, paper birch (*Betula papyrifera*), and black cherry (*Prunus serotina*). The shrub layer is patchy to dense and dry prairie grasses and forbs dominate the ground layer.

Long-term management objective - Barrens oak savannas will be managed to encourage regeneration of the savanna community and current work to expand Karner Blue butterfly habitat will continue with creating a patchwork of open savanna adjacent to the occupied areas. Management treatments might include, commercial firewood and other timber sales, girdling and herbicide application, scarification, and prescribed burning. Areas that are threatened by invasion of non-natives will be managed to reduce the threat of these species.

Short-term management directive - Continue the current management through the use of prescribed fire and brush removal with reference to both the Natural Heritage Registry agreement and the recommendations of the Karner Blue Recovery Plan. Continue management to maintain and enhance the oak savanna habitat based on current management practices and Karner Blue butterfly recovery plan in the areas identified in this plan.

White Pine-Hardwood Forest (mesic subtype)

Description - White pine-hardwood forest communities are located on Plainfield Sand in the Southern portion of the project area on cool, shady, north facing slopes. White pine (*Pinus strobus*) typically forms 20-80% of the canopy cover and sugar maple (*Acer saccharum*) is a co-dominant canopy species. Plants with fundamentally northern affinity occur in this community.

Long-term management objective - The management goal is to maintain the White Pine-Hardwood Forest plant community. These areas do not naturally experience frequent or intense disturbance patterns and should be maintained naturally with out disturbance. Any management in this area should be conducted in a manner that is sensitive to the needs for the community as a whole, including the forest interior birds that breed in this area.

Short-term management directive - Manage these areas in a fashion compatible with the long-term objectives stated above. Conduct field inventories in these communities to determine amount of advanced regeneration. Consider and initiate management techniques including prescribed burning to encourage white pine regeneration on these sites.

Bluff Unit

This area occupies the steep bluffs and the tops of the bluffs. This area includes bedrock bluff prairie, oak forest, mesic prairie, and oak woodland-brushland native plant communities. Twelve rare species occupy this unit and a number of rare animal species, including timber rattlesnakes (*Crotalus horridus*) a state threatened species, also utilize the barrens community and travel through various bluff habitats. Mesic prairies in this area contain populations of plains wild indigo (*Baptisia bracteata* var. *leucophaea*) and rattlesnake master (*Eryngium yuccifolium*)- two state listed species. Bluff prairies include five listed species including plains wild indigo (*Baptisia bracteata* var. *leucophaea*), valerian (*Valeriana edulis*), and the only known occurrence of prairie moon wort (*Botrychium campestre*) in southeast Minnesota. Three listed butterflies use a variety of prairie habitats in this bluff unit. Prairie voles (*Microtus ochrogaster*) were recorded in a bluff prairie in the bluff unit. The upland oak forest in the bluff unit provides important habitat for three special concern species that require forest interior habitat: acadian flycatcher (*Empidonax virescens*), cerulean warbler (*Dendroica cerulea*), and red-shouldered hawk (*Buteo lineatus*). The upland oak forest is also valuable to a number of other game and non-game species on the wildlife area. White-tailed deer, ruffed grouse, wood ducks and turkeys rely heavily upon mast produced in oak forests. Young oak forest is especially important to ruffed grouse and wood-cock and successful regeneration of oak by such practices as prescribed burning or timber harvest on Wildlife areas in southeast Minnesota is of high priority.

Oak forest (dry subtype)

Description - Oak forest (dry subtype) often occur on south-to-west-facing slopes with a canopy dominated by northern pin oak (*Quercus ellipsoidalis*), and/or bur oak (*Quercus macrocarpa*).

Long-term management objective - In most cases, dry oak forests will be managed to encourage regeneration of the oak forest communities through controlled burning and, where necessary to open up

canopies, carefully planned logging. Areas that are threatened by invasion of non-natives will be managed to reduce the threat of these species.

Short term management directive - Stand 6, Section 2, T107N R10W will be managed according to the Long-term management objective above considering management techniques such as group selection harvest and prescribed burning (Appendix 5).

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 management objective - Oak woodland-brushlands will be managed to encourage regeneration of the savanna communities through controlled burning and, where necessary to open up canopies, carefully planned logging. Many of these areas have been disturbed by past grazing and have dense understories of prickly ash and other native shrubs that follow grazing. A management goal is to reduce these invasive shrubs. Areas that are threatened by invasion of non-natives will be managed to reduce the threat of these species.

Short-term management directive - Continue to manage these areas with the use of fire and brush removal to encourage the regeneration of the savanna communities.

Oak forest (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*).

Long-term management objective - Many of the high quality mesic oak forests are succeeding to more mixed hardwood communities and eventually will succeed to a maple-basswood community. These areas contain red and white oak, basswood, cherry aspen and other hardwood species in the canopy. Those areas with a preponderance of maple/basswood and northern hardwood regeneration will be allowed to succeed to maple/basswood forests. Consultation with Ecological Services personnel will then need to be made to determine if/when future timber harvests are desirable to manage for a diverse age class within these stands.

Those stands that have a high component of oak and other shade intolerant regeneration (central hardwoods as identified in the CSA) will be managed to augment the oak component. Some of these stands are threatened by invasion of nonnative species such as buckthorn and honeysuckle. Management options might include prescribed fire, timber harvest, supplemental planting of oak both pre- and post-harvest, and post-sale treatment efforts. Prescribed fire in adjacent communities of barrens oak savannas, oak forest-dry subtype, oak woodland-brushlands, or dry prairies may be allowed to carry into the mesic oak type as part of larger landscape burns to take advantage of natural firebreaks. Areas that are in valleys managed for the karner blue recovery project will be managed according to the goals of this project.

The high quality mesic oak forest communities located at the upper ends of valleys are important forest interior habitat to rare species such as Acadian flycatcher (*Empidonax virescens*), cerulean warbler

(*Dendroica cerulea*), and red-shouldered hawk (*Buteo lineatus*); these areas will be allowed to succeed without intensive management. Portions of stands that fall outside these “interior” areas then, may be managed differently as outlined above.

Short-term management directive - These areas will be managed in a fashion that is compatible with the long-term objectives stated above. Appendix 5 lists stands that may have some form of vegetation management applied to them during the next seven (7) years. Oak and lowland hardwoods make up the majority of stands listed. Vegetation management could include: prescribed burning, partial cutting, shelterwood or group selection and/or clearcutting to regenerate oak. Acreages listed in Appendix 5 do not necessarily mean that vegetation management will occur on any or the entire stand. Field visits to determine need of management action; desirability of action, or site level prescription will be determined at that time.

Mesic Prairies

Description - These prairies occur at the tops of slopes. Dominant species in these prairies include big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), gray headed coneflower (*Ratibida pinnata*), stiff goldenrod (*Solidago rigida*), white prairie clover (*Petalostemon candidum*), wild bergamot (*Monarda fistulosa*), and heart-leaved alexanders (*Zizia aptera*).

Long-term management objective - These areas will be maintained with fire and brush cutting to control woody competition. Management in the mesic prairie located in the southern end of the project area has included selective girdling and herbicide application to elms.

Short-term management directive - Continue the current management through the use of prescribed fire on habitat adjacent to wetlands, mesic prairies, bluff prairies, and barren oak savanna.

Bedrock bluff prairie

Description - These prairies occur on thin loess over bedrock on steep south-to west-facing bluffs with frequent rock outcrops. Dominant species in these prairies can include little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), side-oats grama (*Bouteloua curtipendula*), procupine grass (*Stipa spartea*), prairie dropseed (*Sporobolus heterolepis*), plains muhly (*Muhlenberia cuspidata*), birdfoot coreopsis (*Coreopsis palmata*), gray goldenrod (*Solidago nemoralis*), silky aster (*Aster sericeus*), and leadplant (*Amorpha canescens*).

Long-term management objective - These areas will be maintained with periodic fire and brush cutting to control woody competition.

Short-term management directive - Continue the current management through the use of prescribed fire on habitat adjacent to wetlands, mesic prairies, bluff prairies, and barren oak savanna.

Floodplain Unit

Occupies the seasonally flooded river bottoms of the Whitewater River. Though the floodplain unit is highly disturbed by past cultivation and invasion of reed canary grass (*Phalaris arundinacea*), it provides habitat for eight rare animal species. The floodplain unit includes small patches of floodplain forests and wet meadows. Three listed species including acadian flycatcher (*Empidonax virescens*), cerulean warbler (*Dendroica cerulea*), and red-shouldered hawk (*Buteo lineatus*) require forest interior habitat and use both the floodplain forest and the adjacent upland forest communities. Healthy populations of pickerel frogs (*Rana palustris*) are found in ponds and wet, shrubby floodplains in the unit. The American brook lamprey (*Lampetra appendix*) inhabits portions of the Whitewater River in this area.

Floodplain Forest

Description - These forests occur on alluvium on seasonally flooded river bottoms. The dominant canopy species can include a combination of silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), and black willow (*Salix nigra*). Other canopy trees can include green ash (*Fraxinus pennsylvanica*), bur oak (*Quercus macrocarpa*), river birch (*Betula nigra*), American elm (*Ulmus americana*), and slippery elm (*Ulmus rubra*).

Long-term management objective - The floodplain forest in the Whitewater Sand Savanna are fairly degraded and the goal for these areas will be managed to restore a diverse floodplain forest community type and to encourage the continued existence of the forest interior bird species that currently occupy these areas. At present these forests are relatively low in diversity, as most are young forests that regenerated following agricultural use. Areas that are not threatened by reed canary grass and are regenerating the overstory species such as cottonwood and silver maple will be maintained with minimal management. Areas of floodplain forest that are dominated by reed canary grass will be managed to minimize this risk. Areas that are regenerating box elder as the major understory species will be managed to encourage the regeneration of overstory species such as cottonwood and silver maple and decrease the dominance of box elder.

Short-term management directive – Appendix 5 lists stands that may have some form of vegetation management applied to them during the next seven (7) years. Oak and lowland hardwoods make up the majority of stands listed. Vegetation management could include: prescribed burning, partial cutting, shelterwood or group selection and/or clearcutting to regenerate oak. Acreages listed in Appendix 5 do not necessarily mean that vegetation management will occur on any or the entire stand. Field visits to determine need of management action; desirability of action, or site level prescription will be determined at that time.

Based on the condition of seedling regeneration, stands 5,6, Section 3, T107N R10W; stands 3,4,5, Section 10, T107N R10W; and stands 12, Section 34; stand 14, Section 35, of T108N R10W (as identified in the CSA database) of Floodplain Forest will be managed to remove the dominant box elder canopy and regenerate the area to a diverse floodplain forest community. Practices might include commercial timber harvest, direct seeding, scarification with bull-dozer to remove undesirable competition (i.e., reed canary grass) or tree planting. A portion of Stand 12, SWSW Section 11, T108N R10W that is currently in agriculture will be direct seeded to diverse lowland hardwoods (Appendix 5).

Wet meadow

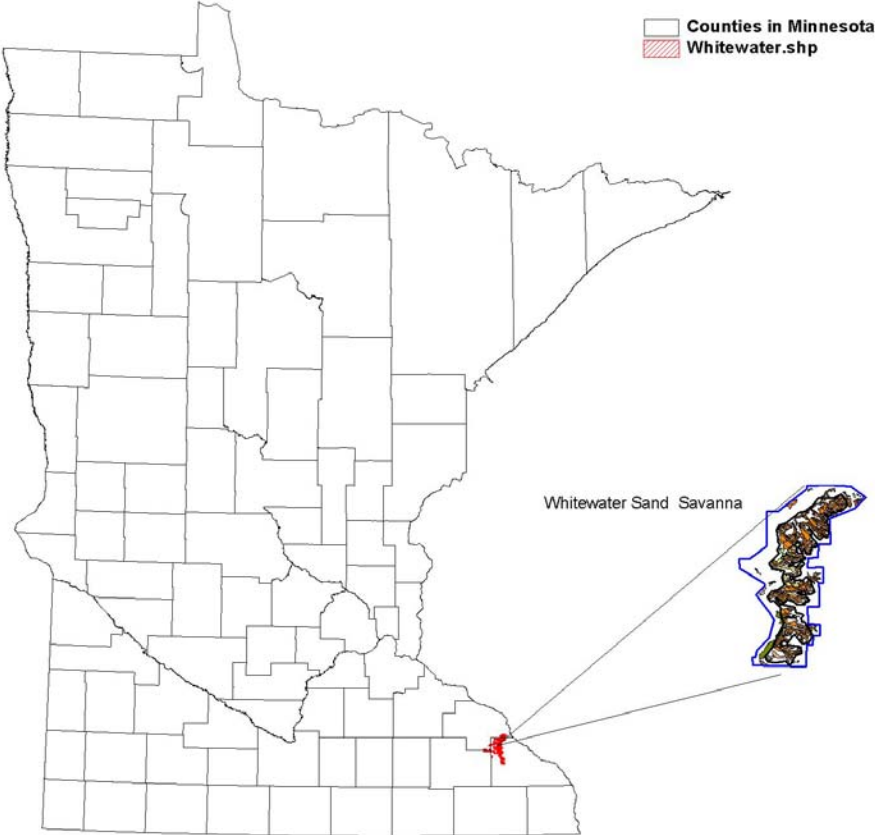
Description - Open wetlands occurring as dense mats of floating vegetation in old channels of the river. Dominant species include lake sedge (*Carex lacustris*), tussock sedge (*Carex stricta*), bristly sedge (*Carex comosa*), spotted joe-pye weed (*Eupatorium maculatum*), and Labrador bedstraw (*Galium labradoricum*).

Long-term management objective - These areas will be managed to maintain the wet meadow community. Areas that are threatened by invasion of non-natives will be managed to reduce the threat of these species.

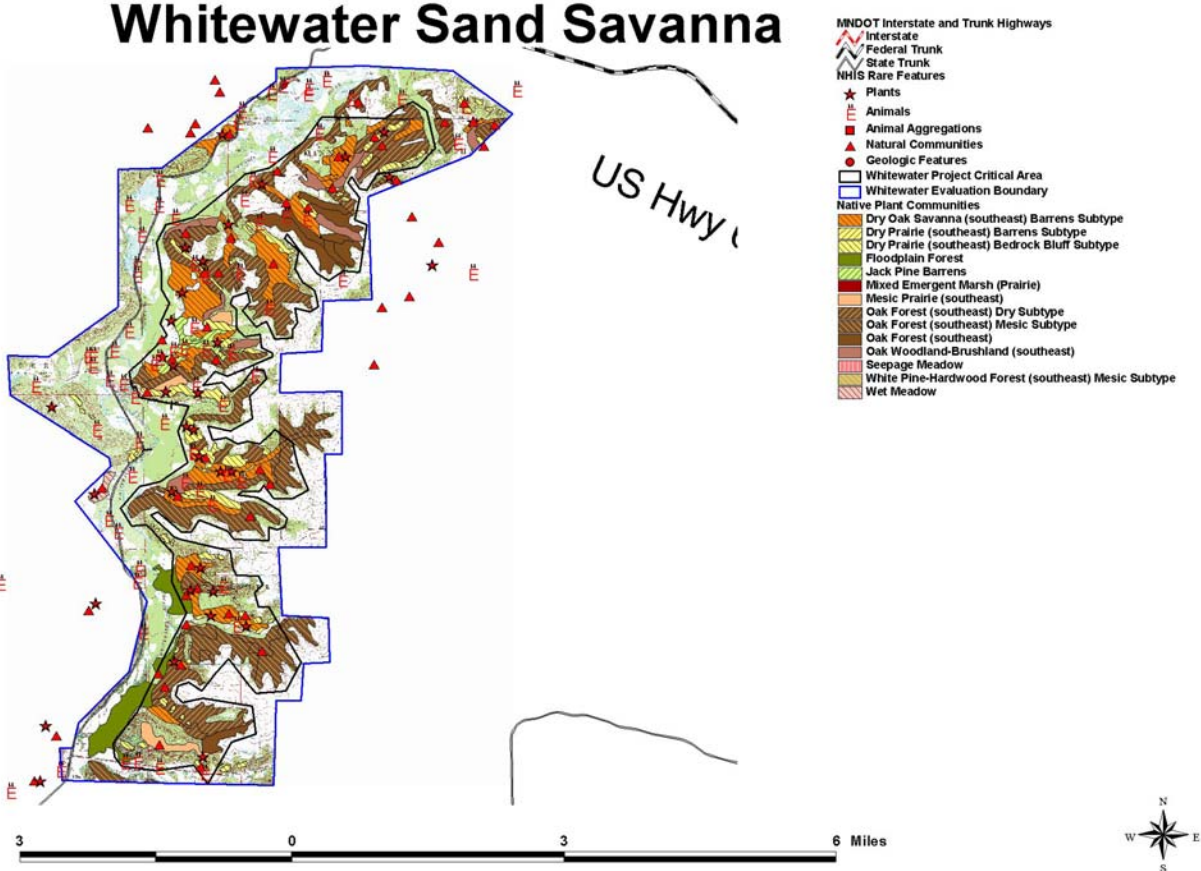
Short-term management directive - Continue to manage this area in a way that helps to maintain the wet meadow community.

Appendix 1: Whitewater Sand Savanna Project Area Location

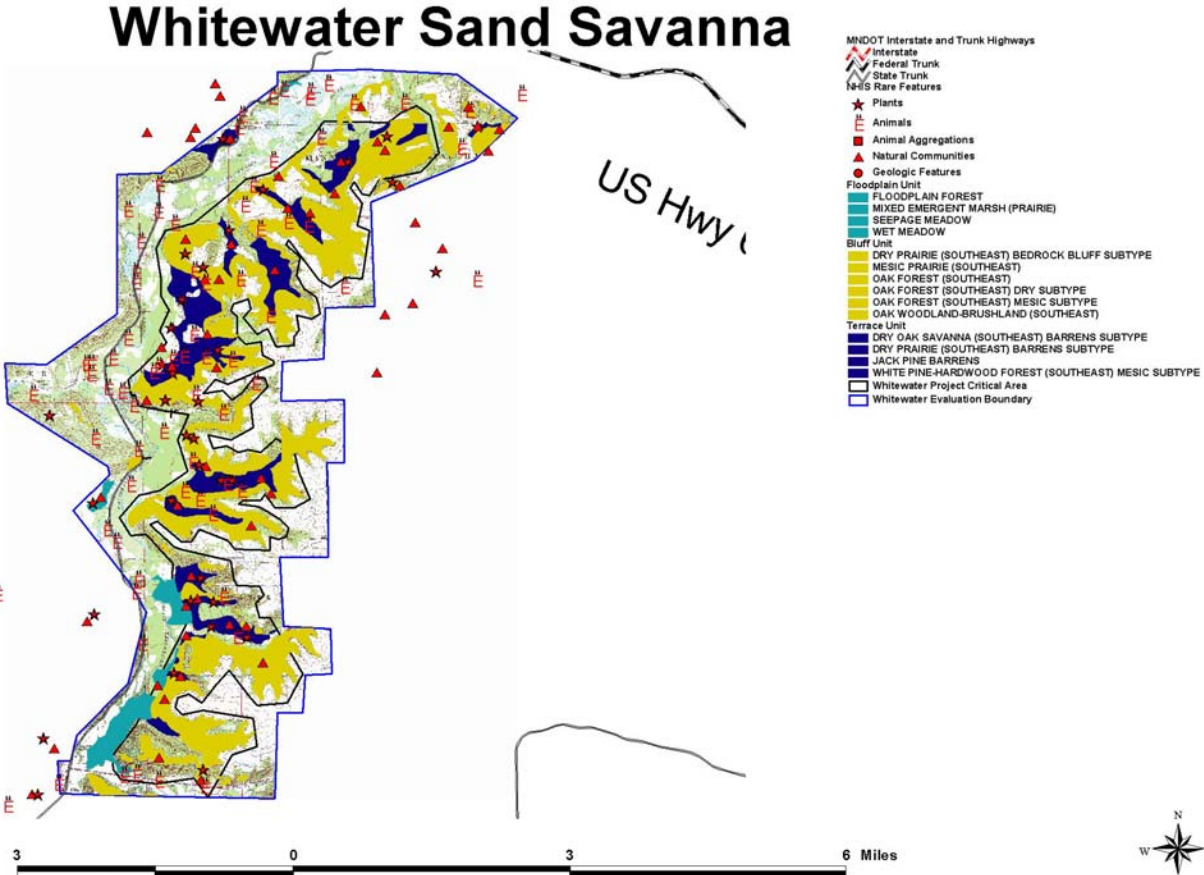
Whitewater Sand Savanna-Whitewater WMA



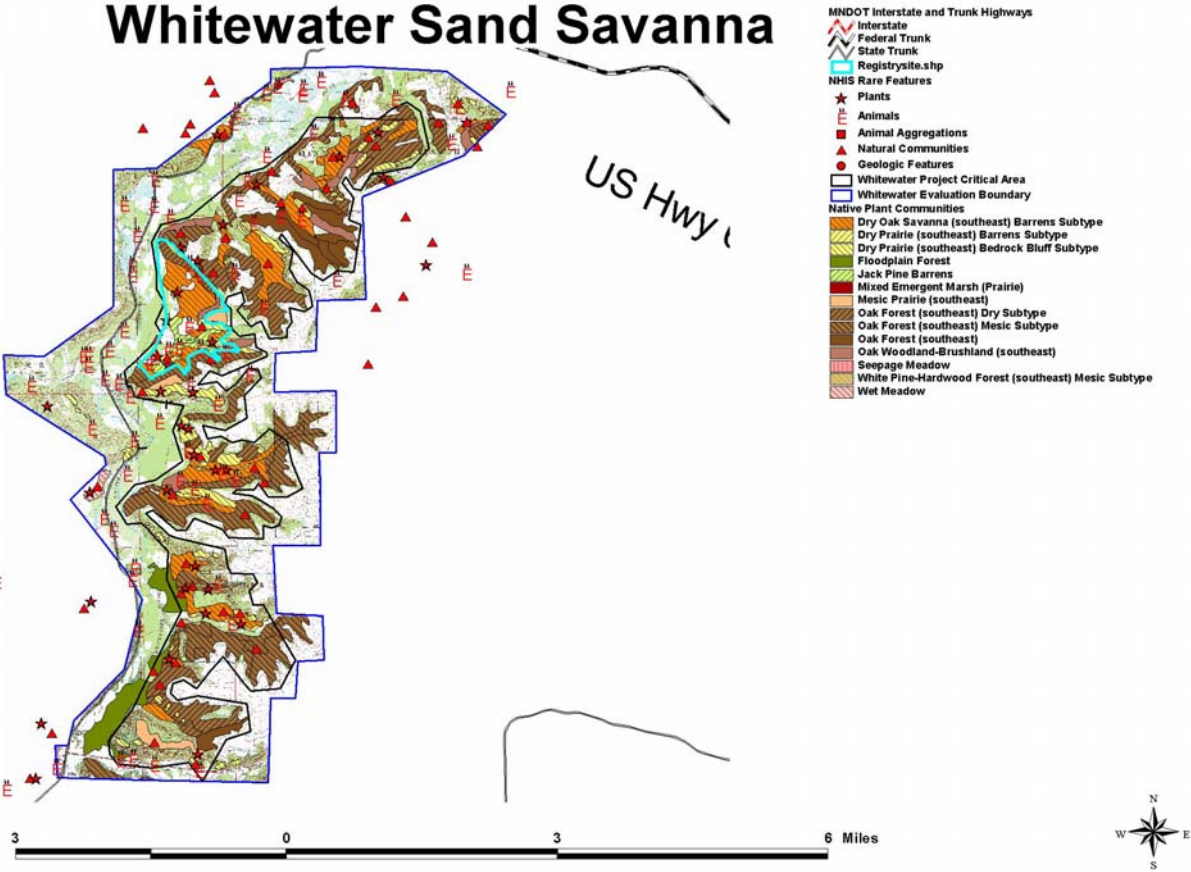
Appendix 2: Native Plant Communities & Rare Elements



Appendix 3: Terrace, Bluff, and Floodplain Units



Appendix 4: Registry Site



Appendix 5: Stands Selected for Management Review

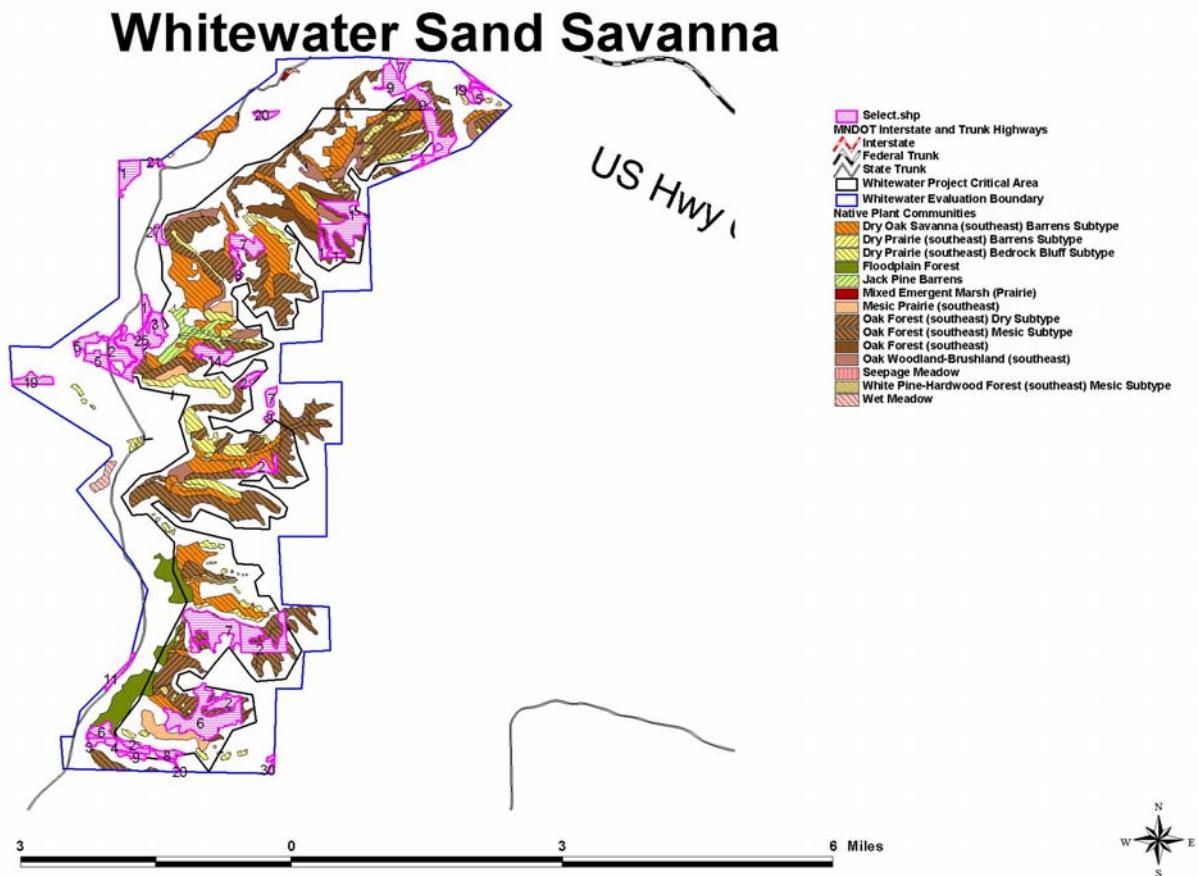


Table 1. Stands listed as potential candidates for vegetation management during next 7 years.

Township	Range	Section	Stand #	CSA Type ¹	Natural Community	Acreage ²
107	10	2	2	NP	*	21
		2	6	Oak	Oak Dry	131
		3	5	LH	Floodplain Forest	4
		3	6	LH	Floodplain Forest	21
		3	11	Red Cedar	*	22
		10	2	LH	Floodplain Forest	10
		10	3	LH	Floodplain Forest	8

¹ CSA Types: NP=Norway pine; RP=Red Pine; WP=White Pine; LH=Lowland Hardwood; CH=Central Hardwood

² Acreage of Stands – Vegetation management will not necessarily be conducted on entire stand.

		10	4	LH	Floodplain Forest	14
		10	5	LH	Floodplain Forest	6
		10	9	LH	*	10
		11	8	LH	*	13
		11	20	LH	*	32
		12	30	Oak	*	114
		12	31	LH	*	22
108	9	5	4	LH	*	82
		7	1	Oak	Oak SE	105
		7	2	Oak	Oak SE	7
108	10	1	20	Willow	*	10
		2	21	LH	Oak Brush	19
		3	1	Oak	Oak Brush	268
		11	27	Walnut	*	11
		12	7	Oak	Oak Dry	35
		12	8	Birch	Oak Dry	11
		13	2	Oak	Mesic Oak	11
		14	1	LH	*	14
		14	3	LH	*	23
		14	14	Oak	Mesic Oak	33
		14	25	LH	*	25
		15	2	LH	*	38
		15	3	LH	*	49
108	10	16	19	Oak	*	26
		24	2	Oak	Mesic Oak	22
		24	7	RP	*	12
		24	8	WP	*	5
		35	7	Oak	Mesic Oak	101
		36	2	Oak	Mesic Oak	72
109	9	31	7	LH	*	14
		31	9	LH	*	61
		32	1	WP	*	8
		32	4	Oak	*	30
		32	5	Ash	Dry Prairie	9
		32	19	CH	Dry Prairie	9

* Type not mapped as native plant community in Project Boundary

Appendix 6: Rare Features Summary – Sand Savanna Area

Native Plant Communities

	<u>EO-Rank¹</u>
Dry oak savanna (Southeast Section) barrens subtype	C
Dry Prairie (Southeast Section) Bedrock Bluff Subtype	A, B, C
Mesic prairie	BC, CD
Jack pine barrens	BC
Oak Forest (Southeast section) Dry subtype	B, BC
Oak Woodland-brushland (Southeast Section)	C
Oak Forest (Southeast Section) Mesic Subtype	B, C
Floodplain forest	CD
White Pine-Hardwood Forest (Southeast Section) Mesic subtype	AB
Wet Meadow	C

Rare Plants

	<u>Status</u>
<i>Talinum rugospermum</i> (rough-seeded fameflower)-18	E
<i>Aureolaria pedicularia</i> (fernleaf false foxglove)-1	THR
<i>Valeriana edulis</i> var. <i>ciliate</i> (valerian)-30	THR
<i>Aristida tuberculosa</i> (sear-beach needlegrass)-10	SPC
<i>Asclepias amplexicaulis</i> (clasping milkweed)-28	SPC
<i>Baptisia bracteata</i> v. <i>leucophaea</i> (Plains wild indigo)—46	SPC
<i>Botrychium campestre</i> (prairie moonwort)-1	SPC
<i>Cirsium hillii</i> (Hill's thistle)-19	SPC
<i>Eryngium yuccifolium</i> (rattlesnake-master)-17	SPC
<i>Hudsonia tomentosa</i> (Beach-heather)-6	SPC
<i>Orobanche uniflora</i> (one-flowered broomrape)-5	SPC
<i>Solidago sciaphila</i> (Cliff Goldenrod)-84	SPC
<i>Tephrosia virginiana</i> (goat's rue)-36	SPC
<i>Helianthemum canadense</i> (Canada frostweed)-17	NON
<i>Hieracium longipilum</i> (long-bearded hawkweed)-18	NON
<i>Linaria Canadensis</i> (old filed toadflax)-10	NON
<i>Liparis lilifolia</i> (lilia-leaved twayblade)-28	NON
<i>Oxypolis rigidior</i> (cowbane)-8	NON

Lichens

	<u>Status</u>
<i>Buellia nigra</i> –1	E

Rare Animals

	<u>Status</u>
<i>Ammodramus henslowii</i> (Henslow's sparrow)-8	E
<i>Crotalus horridus</i> (Timber Rattlesnake)-2	THR
<i>Emydoidea blandingii</i> (Blanding's turtle)-47	THR
<i>Buteo lineatus</i> (red-shouldered hawk)-8	SPC
<i>Coluber constricto</i> (racer)-27	SPC
<i>Dendroica cerulean</i> (Cerulean warbler)-56	SPC
<i>Empidonac virescens</i> (Acadian flycatcher)-35	SPC
<i>Haliaeetus leucocephalus</i> (bald eagle)-63	SPC
<i>Gallinula chloropus</i> (common moorhen)-13	SPC
<i>Microtus ochrogaster</i> (prairie vole)- 6	SPC
<i>Pituophis catenifer</i> (gopher snake)-30	SPC
<i>Elaphe vulpine</i> (Fox snake)-73	NON
<i>Grus Canadensis</i> (sandhill crane)-9	NON
<i>Heterodon platirhinos</i> (eastern hognose snake)-15	NON
<i>Lampropeltis triangulum</i> (milk snake)-68	NON
<i>Rana palustris</i> (pickerel frog)-57	NON
<i>Vireo bellii</i> (Bell's vireo)-9	NON

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

NON

Jumping spiders*Metaphidippus arizonensis*-3*Sassacus papenhoei*-1**Status**

SPC

SPC

Butterflies*Erynnis persius* (persius dusky wing)-1*Lycæides Melissa samuelis* (Karner blue)-5*Hesperia ottoe* (ottoe skipper)-7*Atrytone arogos* (arogos skipper)-1*Speyeria idalia* (regal fritillary)-4**Status**

E

E

THR

SPC

SPC

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: MOU for Registry Site

Memorandum of Understanding For Inclusion of Portions of Sections 11 and 14 of Whitewater Wildlife Management Area of the Minnesota Natural Heritage Register

The Minnesota Natural Heritage Register recognizes tracts of public land that contain natural features of statewide ecological significance and honors those agencies and individuals that manage these lands to protect and perpetuate the features of interest. Many of Minnesota's finest natural areas occur on public lands. Through careful management of these lands it is possible to preserve and protect a cross section of the rich natural diversity of Minnesota.

This memorandum describes those ecologically significant features that occur within the boundaries of the Whitewater Wildlife Management Area. A map showing the location of the feature(s) and any other information on the occurrence is attached. Included are comments on the appropriate management of the feature and surrounding land to insure the perpetuation of the feature.

The recently developed DNR policy for wildlife management areas recognizes the importance of areas containing these special features. Uncommon species and plant communities of concern are noted as factors that are considered in the management of state wildlife areas. This agreement recognizes specific parcels within wildlife management areas harboring important natural features and establishes management guidelines that will protect and if possible enhance the features.

Natural Features of Interest

The registered area of Whitewater WMA consists of portions of sections 11 and 14 described on the map including most of southcentral section 11 and northern section 14. These sections contain a variety of plant and animal species considered rare in Minnesota and listed on the state endangered, threatened and special concern list. The rare plant species include: Talinum rugospermum (rough-seeded fameflower), Desmodium illinoense (tick-trefoil sp.), Tephrosia virginiana (goat's rue), Asclepias amplexicaulis (clasping milkweed) and Aristida tuberculosa (sea-beach needlegrass). Three additional plant species are on the Natural Heritage Program unofficial watch list. These species are: Hieracium longipilum (long-beared hawkweed), Heliathemum canadense (Canadian frostweed) and Linaria Canadensis (old-field toadflax). The rare animal species include: Hesperia ottoe (ottoe skipper butterfly), Plebejus melissa samuelis (karnar blue butterfly), Sassacus pappenhoei (a species of jumping spider) and Phiddippus apacheanus (a species of jumping spider). Also occurring in this portions of Whitewater Wildlife Management Area are five ecologically significant plant communities including two excellent examples of bluff (goat) prairie, a sand dune prairie and an oak savanna. The oak savanna and dune communities are of particularly high quality. The fifth significant occurrence is a southern outlier population of native jack pine. All but the last of these plant communities are considered threatened in the state. For further details on any of the mentioned elements, refer to enclosed status sheets.

Management Guidelines

Beyond the first steps of recognizing the significance of the features mentioned above and knowledge of their exact occurrence, the adaptation of management guidelines that will perpetuate and promote natural processes at this site is very important. The registered area of Whitewater Wildlife Management Area has prairie and forested regions.

As has been well documented, prairies are ecologically adapted to fire. Prescribed burning is the best method for controlling or reducing noxious weeds while maintaining native prairie species. Prescribed burning is recommended for the sand dune prairie and goat prairie. We urge that care be taken in designing a prescribed burn. There are many factors to consider, for example, it is advisable to set up burn compartments so that an entire habitat is not burned at once. If assistance is needed in designing an appropriate prescribed burn plan or any management plan for the area, please contact the management staff of the Scientific and Natural Areas Program.

Thinning of trees and removal of dead wood and windfalls in forested areas, especially the jack pine stand, should be avoided. Cover planting and seeding of non-native vegetation is not recommended unless restricted to old fields already heavily disturbed.

Off-road vehicles would be damaging to this natural area.

Summary

It is agreed that, in order to have opportunity to comment on possible impacts of proposed management activities on the natural features of interest, the area wildlife manager will inform the Natural Heritage Program of proposed developments or actions on the registered portions of this WMA. Of particular interest are actions concerning cutting of grass, or other vegetation, water inundation or appropriation, prescribed burning, or the introduction of live plant material including live seeds and woody cover. Unless carefully planned, activities such as these can alter the scientific value and natural qualities of the registered area.

Howard Shepperd _____
Regional Wildlife Manager
Region V - Wildlife

Roger Holmes _____
Chief, Section of Wildlife

Date 9-10-84

Date Sept. 4, 1984

Jon Cole, Manager
Whitewater Wildlife Management Area

Barbara Coffin
Coordinator, Natural Heritage Program

Date 9-10-84

Date August 30, 1984