Anoka Nature Preserve Woodland
Ecological Restoration and Management Plan

Addendum to the Rum River Nature Area Management Plan - December 2012

Purpose of this Plan

The Anoka Nature Preserve, formerly the Rum River Nature Area, has an approved management plan prepared shortly following the donation of a conservation easement to the Anoka Conservation District by the City of Anoka in the fall of 2007. The Rum River Nature Area Management Plan provides a detailed description of the conservation values (pages 2-3), the property history and current conditions (pages 3-5), biological and abiotic landscape features (pages 5-7), and resource issues and concerns (pages 7-8). The plan explains allowable natural resource management activities, including timber removal and species management (page 9). Suggested projects on page 11 are buckthorn and exotic honeysuckle removal, savanna thinning, and prairie restoration. The appendices include a complete legal description with surveyed map, property boundary photo journal, guidelines to minimize and repair impacts to the conservation values of the property, and maps showing the location of trails, topography, soils, land cover, wetlands, invasive species, and ecologically sensitive areas. This plan serves as an addendum to the Rum River Nature Area Management Plan for the ecological restoration of the woodland and references the aforementioned sections and maps without reproducing them. This plan should be read in conjunction with the original management plan.

Desired Outcomes

The Anoka Sand Plain Ecoregion once supported expansive areas of sand dunes, dry prairie, and oak savanna typically set in a landscape with sprawling wetland complexes. Fire acted to naturally suppress tree growth, favoring species such as bur oak, whose thick furrowed bark makes them resistant to fire. According to *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife* (pages 70-75), the Anoka Sand Plain is home to 97 species in greatest conservation need, with 39 of those listed as federal or state endangered, threatened or special concern. Habitat loss and degradation is the primary factor influencing this decline and it is focused on the terrestrial areas, where natural habitats first gave way to agriculture and then finally to housing and other forms of development. A combination of the location of the Anoka Sand Plain spanning from Anoka County in the seven county Metro Area up to St. Cloud along the Highway 10 corridor, the suitability of the dry sandy uplands for development, and suppression of fire spelled disaster for native terrestrial ecosystems in the Anoka Sand Plain.

Restoration of terrestrial ecosystems to support indigenous wildlife is a high priority. Oak savanna and native prairie are the top two priority ecosystems listed in *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife* (pages 70-75). Invasive species management is the top strategy listed for both (page 74). 1938 aerial photography shows the project site to have been oak savanna. A history of supporting oak savanna along with it proximity to the Rum River and prairie restoration plans, make the project area ideally suited to oak woodland invasive species control and savanna thinning.

Project Benefits

This project will result in the restoration and/or enhancement of a highly desirable habitat on a permanently protected property. Increased diversity of native vegetation, improved habitat quality and wildlife food resources will be more prevalent, creating a valuable wildlife hub in the Rum River corridor. The project will also increase public awareness about the fragility of our natural ecosystems and the important role they play in our enjoyment of outdoor recreational activities.

Many benefits for local flora, fauna and people will result from this project. By removing undesirable woody species, additional sunlight will reach the forest floor and encourage the growth of native species critical to a healthy ecosystem. Local wildlife including butterflies, songbirds and mammals are adapted to native vegetation and rely on it as a source of food and protection. Blanding's turtles are present in the area, and Sandhill Cranes are frequently spotted in the park. The undesirable woody species that currently dominate the woodland provide limited habitat value. The berries produced by common buckthorn are believed to have a laxative effect on the birds that eat them, leaving them dehydrated and malnourished.

Thinning of eastern red cedar an other large trees such as Siberian Elm in a combined area of approximately 14 acres will create openings in the canopy sufficient to support savanna habitat. Providing a complex of savanna, restored woodland, forest, restored prairie, wetlands, and riparian habitat in a 200 acre area protected by conservation easement that is close to the urban interface will attract and support an abundance of wildlife that can be enjoyed by people in the area.

The park is connected by walking paths to a local high school that uses the park to teach students about different ecosystems. Enhancement of the woodland will provide unique opportunities to teach people about the importance of high value habitat and the effort it takes to restore it. By improving public understanding of the role the Anoka Nature Preserve plays as a hub for wildlife along the Rum River corridor, they will gain a greater appreciation for the protected land and the wildlife that relies on it.

Planning

The Minnesota Conservation and Preservation Plan lists "Land and Water Restoration and Protection" as one of its five strategic areas of framework. This specifically identifies the restoration of critical land and water habitat as an important strategy to increase habitat value and biodiversity throughout the state. Through the proposed invasive species treatment project, portions of the woodland in the Anoka Nature Preserve will be restored to valuable oak woodland habitat. This habitat is located adjacent to one of the highest quality water bodies in Anoka County; the Rum River. The project will conform to the Statewide Conservation and Preservation Plan by working to restore a portion of a crucial habitat corridor.

The project strongly supports the Minnesota Forest Resources Council's *Forest Resource Management in East Central Minnesota, A Landscape Perspective (June, 2004)*. The Forest Resource Council's plan identifies oak stands as a management priority. The project will enhance biological diversity in the preserve as well as improve forest health and habitat value. Managing invasive species in oak savannas is a priority conservation action identified in the State Wildlife Action Plan (p.74). Historically the dominant native land cover type for the area is oak savanna. The dominant tree species in the park today is oak, and removing buckthorn and other select undesirable species will ensure oak trees can regenerate. This project also addresses the Lessard Sams Outdoor Heritage Council's priority action for metropolitan urbanizing areas of protecting, enhancing, or restoring oak savanna.

Design and Scope of Work

The goal of this project is to initiate savanna thinning and oak woodland restoration through the removal of select eastern red cedar and other large trees and the treatment of woody invasive species, mainly buckthorn, in the woodland areas of the Anoka Nature Preserve. There are approximately 130 acres of woodland infested with common buckthorn and other invasive species. Map six shows the levels of infestation, ranging from sparse to heavy. We propose to treat the entire area. Efforts will start in the areas of the preserve where previous inventories show infestations are sparse (northwest), and work towards areas of heavier infestation (southeast). This way we will develop a "front" that can be extended as the project progresses.

Woodland restoration involves several elements; treatment of invasive species with herbicide, removal of undesirable woody biomass, and supplemental plantings if necessary. The latter element will be postponed to observe natural regeneration and to provide ample time for site preparation through the removal of undesirable woody vegetation. All elements are subject to available funding.

Invasive Species Treatment

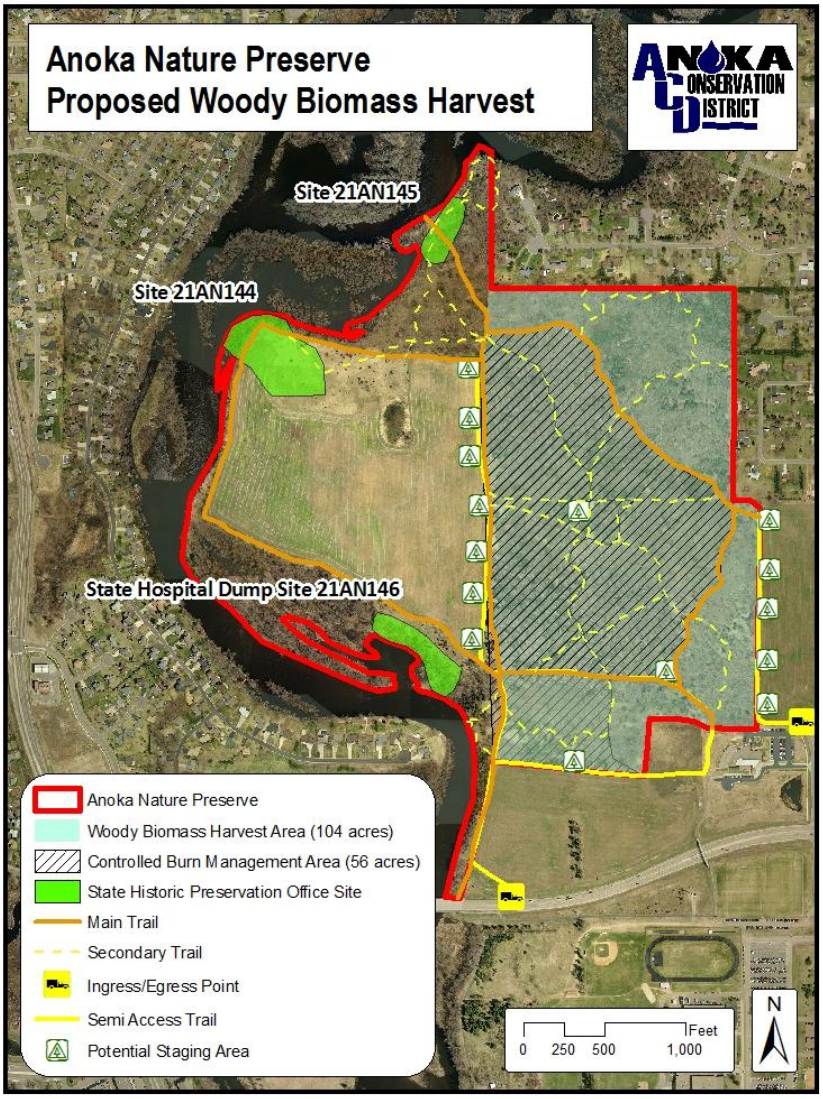
The first year's goal will be to treat all apparent woody invasive species in the 130 acre woodland area identified in the figure below including both the green area as well as the woodland to the north and northwest. Basal bark application of 10% triclopyr based herbicide mixed with diesel fuel as a surfactant is proposed. Subsequent years will treat any new growth or vegetation that was missed in the initial treatment. Treatments will be done in late fall or early winter when buckthorn, honeysuckle and prickly ash are easy to identify and damage from overspray can be minimized. The treated plants will be left standing where funding for woody biomass removal has not been secured. Removing and disposing of the dead vegetation adds significant cost to each acre treated. By leaving the dead vegetation standing, we can treat more acres with limited available funding, resulting in a highly cost-effective project. Additional sunlight reaching the ground will encourage the growth of more desirable species. Unfortunately, it will also allow for a flourish of buckthorn seed that has built up in the soil to germinate. A multi-year treatment approach is critical to address this problem. At least three years of treatment with herbicide will be necessary. Follow up treatments every three years thereafter are desirable.

Savanna Thinning

Removing trees and shrubs to achieve canopy densities of under 25% cover while leaving only select mature oak trees is a first step toward restoration of oak savanna ecosystems. The figure to the right shows a 56 acre controlled burn management area of which not less than 14 acres will be restored to savanna level canopy cover in association with secured funding.

Woody Biomass Harvest

Woody biomass of the treated common buckthorn, tartarian honeysuckle, and prickly ash along with trees and shrubs in areas thinned to savanna canopy cover level will be harvested and utilized. Harvest of woody biomass is desirable because it will accelerate restoration activities, remove fire hazards, and reduce conflict with the public who find the standing dead trees unsightly. The figure to the right shows an 104 acre woody biomass harvest priority area within which not less than 50 acres will be harvested in association with secured funding.



Vegetation Enhancement

Natural regeneration of desirable species, combined with continued treatment of undesirable species may make supplemental planting unnecessary. In July 2012, 31 desirable native grass and forb species (list in the following section) were identified in open patches by a DNR Regional Plant Ecologist. This project is a long term effort and will leverage the benefits of time to cut costs by allowing natural processes to occur at their own place. If it becomes clear after three years of active site preparation that the seed bank is insufficient to produce the desired result, supplemental seeding and planting will be pursued. This will require an influx of funds not yet identified. If and when supplemental planting becomes necessary, plant materials of local ecotype will be sought and protocols used consistent with the Board of Water and Soil Resources *Native Vegetation Establishment and Enhancement Guidelines* or other protocol recommended at the time.

Desirable Vegetation

The number and variety of desirable species for woodland and oak savanna vary greatly. The following species were selected from a list from *Minnesota's St. Croix River Valley and Anoka Sandplain: A Guide to Native Habitats* (MNDNR, D. Wovcha, B. Delaney, G. Nordquist), as a general guideline of what will be looked for to determine if supplemental planting should be pursued. A total of 25-40 of the following native species is desired. Canopy densities goals for woodlands are 25-40% and for savanna are less than 25%.

Common Name	Scientific Name	Layer	Ecosystem
Bur Oak	*Quercus macrocarpa*	Canopy/Subcanopy	Woodland/ Savanna
Northern Pin Oak	*Quercus ellipsoidalis*	Canopy	Woodland/ Savanna
Red Oak	*Quercus rubra*	Canopy	Woodland
Quaking Aspen	*Populus tremuloides*	Canopy	Woodland
Black Cherry	*Prunus serotina*	Subcanopy	Woodland
Eastern Red Cedar	*Juniperus virginiana*	Subcanopy	Woodland
American Hazelnut	*Corylus americana*	Shrub	Woodland
Gray Dogwood	*Cornus foemina*	Shrub	Woodland
Juneberries	*Amelanchier spp.*	Shrub	Woodland
Chokecherry	*Prunus virginiana*	Shrub	Woodland/ Savanna
Common Blackberry	*Rubus allegheniensis*	Shrub	Woodland
Red Raspberry	*Rubus strigosis*	Shrub	Woodland
Virginia Creeper	*Parthenocissus quinquefolia*	Ground	Woodland
Blueberry	*Vaccinium angustifolium*	Ground	Woodland
Wild Grape	*Vitis riparia*	Ground	Woodland
Leadplant	*Amorpha canescens*	Ground	Woodland/ Savanna
Prairie Rose	*Rosa arkansana*	Ground	Savanna
Hog-peanut	*Amphicarpa bracteata*	Ground	Woodland
Canada Mayflower	*Maianthemum canadense*	Ground	Woodland
Pointed-leaved Tick-trefoil	*Desmodium glutinosum*	Ground	Woodland
Big-leaved Aster	*Aster macrophyllus*	Ground	Woodland
Wild Sarsaparilla	*Aralia nudicaulis*	Ground	Woodland
Star-flowered False Solomon's-Seal	*Smilacina steallata*	Ground	Woodland
Pussytoes	*Antennaria sp.*	Ground	Woodland
Hoary Puccoon	*Lithospermum caroliniense*	Ground	Savanna
White Sage	*Artemisia ludoviciana*	Ground	Savanna
Gray Goldenrod	*Solidago nemoralis*	Ground	Savanna
Large-flowered Beard-tongue	*Penstemon grandiflorus*	Ground	Savanna
Butterflyweed	*Asclepias tuberosa*	Ground	Savanna

Common Name	Scientific Name	Layer	Ecosystem
Purple Prairie Clover	*Petalostemon purpureum*	Ground	Savanna
Silky Prairie Clover	*Petalostemom villosum*	Ground	Savanna
Ground-cherry	*Physalis virginiana*	Ground	Savanna
Missouri Goldenrod	*Solidago missouriensis*	Ground	Savanna
Prairie Bird-foot Violet	*Viola pedatifida*	Ground	Savanna
Prairie Larkspur	*Delphinium virescens*	Ground	Savanna
Rough Blazing-Star	*Liatris aspera*	Ground	Savanna
Rigid Sunflower	*Helianthus rigidus*	Ground	Savanna
Porcupine Grass	*Stipa spartea*	Ground	Savanna
Hairy Grama	*Bouteloua hirsuta*	Ground	Savanna
Little Bluestem	*Schizachyrium scoparium*	Ground	Savanna
Junegrass	*Koeleria macrantha*	Ground	Savanna
Pennsylvania Sedge	*Carex pensylvanica*	Ground	Woodland
Big Bluestem	*Andropogon gerardii*	Ground	Woodland/ Savanna

During a field visit on July 9, 2012, Hannah Texler, MN DNR Regional Plant Ecologist, identified the following 31 herbaceous native oak savanna species in openings in the forest canopy.

Graminoids	
Scientific Name	Common Name
Andropogon gerardii	big bluestem
Bouteloua curtipendula	side-oats grama
Carex pensylvanica	Penn's sedge
Carex sp.	a species of *Carex*
Dicanthelium acuminatum subsp. Implicatum	hairy panic grass
Leptoloma cognatum	fall witch grass
Schizachyrium scoparium	little bluestem
Stipa spartea	porcupine grass

Forbs, low shrubs, vines	
Scientific Name	Common Name
Achillea millefolium	yarrow
Amorpha canescens	leadplant
Anemone cylindrica	long-headed thimbleweed
Antennaria neglecta	field pussytoes
Arabis sp.	a species of rock cress
Artemisia caudata	tall wormwood
Asclepias verticillata	whorled milkweed
Aster oolentangiensis	skyblue aster
Celastrus scandens	climbing bittersweet
Dalea purpurea	purple prairie clover
Erigeron annuus	annual fleabane
Fragaria virginiana	wild strawberry
Galium asprellum	rough bedstraw
Geum triflorum	prairie smoke
Helianthemum bicknellii	hoary frostweed
Heuchera richardsonii	alumroot
Lespedeza capitata	round-headed bush clover
Mirabilis nyctaginea	heart-leaved four o'clock
Pyrola elliptica	shinleaf
Solidago Canadensis	Canada goldenrod
Solidago rigida	stiff goldenrod
Toxicodendron rydbergii	poison ivy
Viola pedatifida	bearded birdfoot violet

Sustainability and Maintenance

Long-term management of buckthorn is critical to a successful project. By implementing several waves of treatment over three years (2012, 2013, 2014), we will be able to do multiple treatments over the same area. This method will help to exhaust the existing seed bank and reduce the chances of buckthorn re-growth. We will use the initial project to train volunteers on proper buckthorn identification and treatment methods, and use the existing partnership between

the City of Anoka, the Friends of the Anoka Nature Preserve, and volunteer sources to ensure long term maintenance activities are carried out.

Maintenance of this project once it is completed should be minimal. Buckthorn seed remains viable for up to five years in the soil, so a sweep of the preserve to identify and treat any buckthorn re-growth once a year will keep its population under control and provide the opportunity for native species to become re-established. The City of Anoka is committed to providing herbicide for periodic treatment, and we estimate roughly $600 in herbicide will be needed over a three year period after the initial project is complete.

Accomplishment Timeline

Activity	Description	Element	Date	Resp. Party
Buckthorn/honeysuckle/prickly ash treatment	Initial treatment of 130 acres	Site prep	Oct 2012 - Jan 2013	ACD
Cedar thinning	14 acres	Site prep	Dec 2012 - Feb 2013	ACD
Treated buckthorn/ honeysuckle/ prickly ash cut and moved to staging areas	50+ acres along access trails	Site prep	March 2013 - April 2013	ACD
Shipping of woody biomass	After road restrictions but before June 2013.	Site prep	April 2013 - May 2013	ACD
Buckthorn/honeysuckle/prickly ash retreatment	Follow-up treatment of missed vegetation / germination	Maintenance	Oct – Nov 2013, 2014, 2015	ACD
Vegetation assessment	Inventory to determine if diversity goals are met	Plant establishment	June 2015 - Aug 2015	ACD/ City of Anoka
Vegetation enhancement plan	Prepare plan and seek funding to supplement species if necessary	Enhancement	September 2015 and beyond	ACD/ City of Anoka

ACD – Anoka Conservation District