

Basic Management of Natural and Undeveloped Open Space **Proposed for the City of Madison** -Si Widstrand 5-27-11

The City of Madison owns approximately 6000 acres of open space. 2000 acres are developed with facilities and mowed turf. 2000 are designated as Conservation Park. The remaining 2000 acres of undeveloped open space are scattered throughout the City in its park and drainageway system. There are restoration projects underway in the Conservation Parks, although implementation is underfunded, and there is no overall management plan for the entire system. There is a policy and plan for drainageway maintenance although it does not adequately address the natural aspects of the system. There is no plan for most of the natural acreage scattered throughout the parks. This proposal will consider all 4000 acres of natural and undeveloped open space, so that its management and restoration can be implemented using City, donated and volunteer efforts.

Goal and Intent

The goal of this proposal is to have the City develop a plan to address several adopted City policies relating to the preservation of natural areas. It is intended to develop a maintenance system that provides a basic level of management to all City-owned open spaces. It is intended to be a simple operational guide for basic maintenance practices on natural and undeveloped lands. It is intended to be implemented by park workers who know 20-40 plant species – the most common desirable trees and shrubs, and the most common invasive species.

Basic Management consists of having an inventory of all the natural spaces; having a simple plan for minimal maintenance of each area by annual mowing or other available practices; establishing maintainable landscape types; removing invasive woody plants that are directly competing with established native trees; and monitoring to ensure that all areas are checked periodically.

Improved Management, maintaining and restoring high quality natural areas, is a second level of management that is not addressed by this proposal. Such complex restoration of Conservation Parks and other high quality areas should be addressed as a followup to this proposal.

Adopted Policies and Recommendations

There are pertinent goals and recommendations in adopted plans going back decades. These are the most recent:

2006 Comprehensive Plan, Volume II, p6-7, 6-12: **“Goal: Regard land as an irreplaceable resource and ensure that its use does not impair its value for future generations. ... Objective 2: Preserve and enhance lands of significant natural value. Policy 1: Protect lands having significant natural values within the City limits and in outlying areas... Policy 3: Identify unique high quality natural environments and work with property owners, as well as City agencies and Commissions, to protect these**

environments... **Objective 6:** Protect and preserve native, endangered, threatened and unique plants and animals, wildlife habitats, and native ecological communities in the Madison area... **Policy 5:** Encourage the restoration of indigenous plant communities and wildlife habitat in all private and public developments... **Policy 7:** Encourage management and preservation of existing woodlands as an economic land use, as wildlife habitat, as an erosion control measure, and as a means of preserving the natural beauty of Madison and Dane County.”

2006 Comp Plan, Volume II, p7-13: “**Preserve Madison’s Legacy of Parks.** Increase the renovation and maintenance of historic park and landscape features. Also improve the management of the non-turf landscaped areas in both old and new parks.

2006 Comp Plan p7-14: **Conservation Park Needs.** ...Expand the management of existing conservation lands by controlled burning, with a goal of burning 400 acres annually, in addition to other management techniques...”

Draft Madison Sustainability Plan - February, 2011:

“**NATURAL SYSTEMS: ...GOAL 6: Restore and maintain natural habitat**

...-Preserve and restore stream valleys, marshes, prairies, woodlands, scenic and historic areas by including them in the park and open space system whenever possible.

-Reduce impacts from invasive species on natural areas.

Actions...

-Prevent additional invasive species from arriving, and control those already present.

-Identify and create a plan to restore degraded wetlands.”

(I have suggested an additional action: “**Complete and begin implementing a plan for basic management of all city-owned natural and undeveloped areas. Include inventory, quality assessment, proposed actions, prioritization and cost estimates.**”)

Maintainable Landscape Types

This proposal will discuss these lands in terms of maintainable landscape types, i.e. plant communities that can be maintained or restored with a long-term maintenance program that controls invasive species and selectively favors long-lived natives. These are park landscapes that are usually simpler and lower quality than “native plant communities” so the native communities nomenclature has been avoided. Initial work may be required to establish the maintainable landscape, or to transition it from one type to another type, but the ongoing maintenance should not be extensive, expensive or overly complex. The following are considered maintainable landscape types:

Ponds and wet marsh

Wet meadows

Grassy meadows

Brushy meadows/Savanna meadows

Forest edges and openings

Open Woods

Forest with invasives

Forest with natives

Management and Restoration Practices

The following practices are used in Madison. All are aimed at reducing the undesirable species and increasing the competitive advantage of desirable species. Their use will be detailed later for each landscape:

Mowing of herbaceous and woody material is used to top-kill undesirable plants, although resprouting usually occurs. The goal of topkill is to change the competitive balance between plants, i.e. to favor noninvasive herbaceous species over invasive herbs or woodies. Mowing is often used for patches of invasives or for areas where burning is desirable but impractical. Mowing can be used in open woodlands, grasslands, and wet meadows (when dry or frozen).

Burning has an effect similar to mowing, and has additional advantages when native herbaceous species are present. Larger woody stems may escape burn damage, and burned stems also resprout. Burning is more efficient than mowing for large landscapes, and for wet areas that cannot be mowed.

Herbicides are used in spot applications on invasive species, usually on cut stumps or on the foliage of resprouts. It is the best treatment for eliminating large seed trees of invasive species. It is also desirable as a foliar application for selective treatment of patches of invasives, in combination with other follow-up treatments that may not kill completely. In a replanting and restoration, herbicide may be used to kill all existing vegetation on a site to reduce competition before seeding native species.

Manual Removal is a labor intensive approach that requires many volunteer hours, but is the most effective way to do many follow-up treatments, especially in areas that cannot be mowed or burned. Pulling invasive plants like sweet clover, garlic mustard, honeysuckle and buckthorn removes the entire plant. Lopping or hand-sawing small woody stems will result in resprouting unless stumps are treated with herbicide.

Shading is more of a strategy than a treatment, but is effective at suppressing the dominance and reseeding of some invasives. This approach selectively promotes desirable trees and shrubs (or plants them) to reduce the vigor of invasives growing beneath them. In some forest situations, shading may be a sufficient deterrent to resprouting of the cut stumps of invasives and competitors, allowing for a reduction in herbicide use.

Biological Controls are available and are used for some of the invasive species that are unchecked by other treatments, or as an alternative to extensive herbicide use.

Controlling water levels is a strategy to maintain native vegetation in wet areas. Low water levels favor woody and herbaceous invaders. Excessive high water levels can flood out native communities and allow invasives to establish. Restoring correct water levels, and having the ability to manipulate water levels, can help to restore native wetland communities which exclude invasives.

Initial Work to Create Maintainable Landscape Types

The initial work will frequently require removal of a significant amount of invasive woody material, often including large trees, and will sometimes require heavy equipment. Volunteers are not typically able to do all of this work. At this stage, the City must use its employees or contractors to do the work, assisted by donated or grant funding. The initial work should NOT be done unless there is a plan for the necessary follow-up management (by volunteers and/or City staff), and the commitment and resources to complete the work.

Prioritization of Projects

The purpose of this plan is to look at all of the lands in City ownership and match the level of maintenance with the conservation potential of each property. In the past, Conservation Parks have had top priority for management and restoration funding, with some City support to neighborhood initiatives in other parks. The best plant communities are in the Conservation Parks, but some of the lands in other parks could also be improved in quality with simple inexpensive treatments. Some of those simple projects will be higher priority than some expensive high cost projects in Conservation Parks, and will generate more volunteer and donor support. It is hoped that this will inspire a dedicated cadre of neighborhood restorationists who will also support Conservation Park projects. Degraded areas of Conservation Parks may also benefit from these simple management techniques to maintain their potential for future restoration.

Management Recommendations by Landscape Type

Management of Ponds and Wet Marsh

The ponds themselves have minimal need for management, unless high quality aquatic communities is a goal for the site. Two prolific invaders of pond edges and drainage channels are non-native reed canary grass and native willows. These invaders have a positive effect of stabilizing soil erosion, and a negative effect of excluding diverse native vegetation that is more desirable for wildlife. Where possible, it is desirable to control these invasives so they do not dominate every Madison pond edge and drainageway. The pond edges also have some specific needs that are interrelated with the need to control Canada Geese, an overabundant native species.

Management of Wet Meadows

These are treeless areas on saturated soils dominated by grass or sedge, often with some shrubs. The goal is usually to maintain dominance by grasses, especially where filtration of runoff is desired. High quality areas are usually maintained with burning. Low-quality areas are often dominated by invasive reed canary grass which excludes most woody vegetation. Some native trees and shrubs are often a good addition to the diversity of canary grass sites and should be retained if they do not interfere with stormwater management. Mowing wet meadows is usually not advisable unless there is woody invasion to be controlled. Mowing can actually spread invasives such as canary grass by creating disturbed sites in wet soil and carrying seeds to them on equipment. Where mowing is necessary (e.g. woody invasion along drainage channels), it can best be done in dry or frozen conditions. Due to the difficulty of completing repeated burning and mowing, woody invasion of these sites might be most efficiently managed with herbicide treatments of cut stems.

Management of Grassy Meadows

A large portion of the City's natural acreage will be in the meadow categories. Most of the City staff maintenance of natural acreage outside of Conservation Parks will be mowing.

The following Meadow and Drainageway Mowing Guidelines were developed for working with Parks and Engineering field staff:

PURPOSE:

We mow to eliminate invasive weeds and woody plants. Well-established grassland has very few new invaders. The goal is to mow the invasives that need to be controlled, at the best time to control those species. The goal is to NOT destroy habitat or aesthetics unnecessarily, waste energy mowing what doesn't need it, or what could more efficiently be burned, or cut and treated with herbicide.

MOW:

Young cottonwoods, box elders, willows
Honeysuckle and buckthorn shrubs
Invasives in flower (before going to seed): Thistle, ragweed, burdock, nettle, teasel, etc.
Trees and weeds in pond bottom and edges when dry

DO NOT MOW:

Planted trees
Young oaks
Blooming prairie / high quality prairie
Quality wetland
Solid grass (no invasives)
Solid native shrubs (no invasives)
More than half of a large site in same year (leave half for wildlife)
Everything – just mow the patches of weeds and woodies
Too close to trees (volunteers will hand cut the last couple feet)
Large diameters (2"+) that should be cut and treated
Scattered invasives (100' apart) that should be cut and treated
Wetland invasives unless wetland is dry or frozen

MOWER CLEANUP

Seeds of invasive plants can easily be spread by mowers, so it is recommended to clean off seeds as well as possible before moving from invaded sites to non-invaded sites. Be aware of the seed issue and plan accordingly.

MOW MAY 1-JUNE 1: Mow patches of invasive leafy spurge, Dame's rocket and garlic mustard to prevent seed production if they cannot be controlled by other means.

MOW JUNE 1-OCTOBER 1: OK to mow "turf and trees" greenways (no nesting birds)

MOW JUNE 15-JULY 15: patches of thistle and invasive brush.

MOW JULY 15-AUGUST 30: patches of ragweed, other weeds and invasive brush. Complete mow of new prairie plantings 1-3 years old after blackeyed susans are done blooming (after 8/1). In some cases, weedy new plantings will have to be mowed before July 15 to ensure survival of prairie seedlings.

MOW AFTER OCTOBER 15: Any good blooming prairies that you want to mow completely (every 2-5 years), any weed and brush patches that have come back (you can mow the unwanted weeds and brush as many times/year as you want if you're in the area for other reasons).

DON'T SPREAD INVASIVE SEEDS JUNE-NOVEMBER: Be aware of invasives going to seed and avoid spreading these seeds. Washing or brushing off equipment before leaving invasive seed sites is essential.

MOW EVERY YEAR: woods edges that have invasives or unwanted woodies (black locust, honey locust, willows send up root sprouts). Mow them on any or all of the schedules above when you are there.

MOW DURING DROUGHT: steep slopes, shorelines, pond edges and bottoms that are usually impossible to get. If it really gets dry, make this a special assignment. You only have to mow the weeds and woodies.

CUT AND TREAT STUMPS WITH HERBICIDE JUNE 1-MARCH 1: The large or scattered woodies that can't be mowed, or that will eliminate the need for mowing. Clonal invasive species such as black locust or silver poplar should be cut and treated, because mowing will stimulate multiple resprouts over a wider area. Do cutting and treating when you're "not busy". Spring sap runs, deep snow and severe droughts are NOT effective times for herbicide treatment.

STAFF TRAINING NEEDS: Staff must be able to identify all of the native and invasive species listed above and below. They should also be able to recognize the 20 most common native trees and shrubs they are likely to encounter in mowing situations. If they can identify these 30-40 plants, they can deal with most situations, and ask for help with plant identification before killing plants they do not know.

Management of Brushy Meadows/Savanna Meadows

These are meadows that have a significant component of native shrubs (dogwood, sumac, viburnum, blackberries), or scattered native trees that will shade less than 50% of the area at tree maturity (oak, hickory, walnut). They are managed like grassy meadows with a few adjustments. Mowers cannot get too close to the trees so manual and/or herbicide treatments are necessary there. The edges of shrub patches should be mowed regularly, but the entire clone should only be mowed every 3-5 years on a rotating basis so there is always shrub habitat available. Leaving shrubs with edible fruit is desirable if they are not being overtaken by invasives.

Management of Forest Edges and Openings

Because the park system contains many small patches of woods, better management of the edges would provide significant and efficient control of a large mass of seed-producing invasives. City staff mows the edge of the woods either weekly or annually. It

would help preserve the old oaks and promote better future trees if the regular annual mowing also included the area under the drip line of the large edge trees. Without such management, growth of invasive trees (box elder, mulberry, black locust) and shrubs (honeysuckle and buckthorn) will shade out the lower branches of large oaks and cause their decline. These areas would have to be cleared of trees and shrubs initially, and the stumps treated with herbicide to prevent resprouting. Then annual mowing would be used to prevent seedlings and resprouts from re-establishing the area. Some seeding of native groundcover species could be done in the cleared areas if invasive seedlings were first killed with herbicides.

Many edges that abut back yards are generally too wooded to mow, so they would be managed as woodland, described below.

Management of Open Woods

Open woods is ideally managed by burning the groundlayer to reduce the establishment of invasive woody seedlings. As an alternative, brush mowing could be conducted annually. To be able to mow, complete cleanup of removed woody material would have to be done, a great job for volunteers. Volunteers could also perform follow-up management by monitoring and pulling invasive seedlings as necessary.

Management of Forest with Invasives

This includes most of the oak woodlots and wooded drainageways, throughout the park system, which have tree densities, slopes, boulders and access problems that prevent mowing. They are densely wooded with old oak trees and several species of younger understory trees. The objective for these areas is to preserve the old oaks, and ensure that the best young trees reach the canopy to be the future generation of forest.

Over the past 30 years, and in coming decades, many canopy openings have been/will be created. Large oaks are dying of old age, insect attack and oak wilt, which is exacerbated by stress from invasive gypsy moth. Elms are dying due to invasive Dutch elm disease. Ash will soon be dying from invasive emerald ash borer. The number of native sub-canopy replacement trees is reduced due to excessive populations of the invasives black locust, mulberry, Norway maple, buckthorn and honeysuckle. Native reproduction may also be suppressed by invasive garlic mustard and soil changes due to invasive earthworms. The most common native understory trees are less desirable for the future canopy because they will die out (ash and elm, cherry with black knot fungus); or overabundant (box elder, cherry). Many of these less desirable trees, and other shade tolerant natives (hackberry and hickory), are also growing up through the old canopy oaks, shading out their lower branches and making them more susceptible to decline.

To compensate for the low number of desirable native trees positioned for growth into the next-generation canopy, a management strategy to promote the best available trees is recommended. This includes preservation of existing old trees by removal of competing/shading trees, and selective removals to promote the best available species to fill canopy gaps. The order of preference on what trees to promote: oaks & hickories, walnut, hackberry, cherry, linden, box elder, cottonwood, black locust, ash, elm. The order of preference might be adjusted slightly to increase diversity in any given woods (e.g. if many walnuts are present, promote more hackberry and cherry.) Removal of native grapevines is also recommended where they impair old oaks and young trees

selected for the canopy. Removal of seed-bearing buckthorn is a desirable step that is less intensive than trying to remove all invasives.

This strategy does not include wholesale removal of ALL the invasives or less desirable trees in the canopy or understory. If there is no better tree likely to benefit, or if the clear-cutting of large canopy trees is culturally unacceptable, the existing canopy may remain (even though it may be black locust, box elder, cottonwood, cherry, ash or elm. If the future canopy trees are doing well, the understory may remain buckthorn and garlic mustard.

Management of Forest with Natives

These sites are comparable to the high quality areas in Conservation Parks, and will be managed to preserve and expand the high quality areas based on ecological concepts of plant communities and diversity. They may be small patches within otherwise low-quality woodland, but they should be identified and managed to preserve their diversity.

Role of Volunteers

It would be especially useful to expand the core group of volunteer land managers, volunteer leaders with some knowledge of ecology and invasives species. These leaders can adopt areas, monitor them, and liaison between volunteers and City staff.

In many of the maintainable landscape types, periodic mowing by City staff will keep the invasives small, so they can efficiently be pulled by volunteers. In conjunction with seed gathering and planting, this could lead to significant habitat improvements in these areas. The key to improving these areas is to identify, maintain and expand areas where there is a base population of native woody or herbaceous species. Volunteers can do this by identifying small areas of native species, and eliminating invasives from these areas by hand-cutting with herbicide stump treatment, or by hand-pulling. These native areas can then be expanded by volunteers with additional cutting/treating and reseedling of natives.

Volunteer activities, skills and equipment:

Volunteer(s) approved to use a chain saw may cut down or girdle trees and shrubs that are competing with more desirable species. A chain saw may also be used to clear trails and prune trees. Cut trees and brush will be removed from trails, sidewalks, mowed areas or highly visible areas. Volunteers may leave brush where it falls, may pile brush for pickup by City crews, or may drag it back into wooded areas, as per agreement with City staff for each project area.

Volunteers approved to use a chain saw will provide their own equipment and safety gear (hard hat, eye and ear protection, chaps, steel toed shoes, gloves), and will keep all equipment well-maintained and in safe working order. Chain saw volunteers are expected to be experienced chain saw users, must be approved by the City, and must sign a release form similar to the one used by the Parks Division. All pruning work and chain saw work is ground work. Anyone trained and equipped as a climbing arborist will have to have specific City approval for that work.

Volunteers may also use a variety of hand tools to assist in the cutting and brush handling, pruning, and removal of invasive species, or other maintenance work. All

pruning of desirable trees will be done in accordance with City ordinances and standards. Use of any other power tools would require specific approval of City staff.

Where the goal is to prevent resprouting of the removed trees, the cut stump or girdled trunk will be treated with an appropriate herbicide (supplied by Parks Division for Parks work). Treatments will be performed by a state certified applicator (who can be a volunteer), following label instructions and all city policies for pesticide application (posting signs and keeping records of use).

All volunteers must sign a standard volunteer release form and report volunteer hours to the City. The volunteers must work safely, and use good judgment about the limits of their equipment and abilities.

Implementation Process

Inventory, assess quality, recommend treatment, establish cost estimates, prioritize:

- The inventory process can be completed in conjunction with Parks and Engineering efforts to inventory all of the mowing practices by parcel, with some volunteer assistance.
- A simple quality assessment and recommendation of treatments can be done by Conservation staff with volunteer assistance.
- Cost estimating and a system of priorities can be developed by Parks staff with some volunteer assistance.
- Adopt a plan approved by the Park Commission.

Implement using City staff and funds, contractors, grants, donations, and volunteer work. Implementation will require:

- Staff Project Manager(s) – work with staff, volunteers, consultants, contractors to provide land management expertise, project labor, purchasing, contract-writing and supervision, monitoring and follow-up management, grant-writing, volunteer outreach. There would be several employees in the Conservation section who could be assigned some of these tasks. Other tasks could be assigned to the volunteer coordinator and the Planning section. Some of the projects will be very simple.
- East and West Parks Maintenance staffs will continue to do the weed and brush mowing, with guidance from the Conservation staff and/or Volunteer Land Managers who may be available for some sites. East and West Forestry staffs will continue to pick up miscellaneous brush piles from staff or volunteer management projects.
- Completion of large projects may have to be contracted privately with staff and volunteers performing the follow-up treatments.
- Any types of work that are considered inappropriate for volunteers will have to be performed by City staff or contractors.
- Volunteers may serve as volunteer stewards, and will continue to be the main source of ongoing manual labor for follow-up treatments like pulling honeysuckle, buckthorn and garlic mustard.
- Budgeted funds for staff, consultants, contractors, plant materials, project management, grant-writing, volunteer outreach (after we determine how much can be done by existing staff or modified staff assignments).

Approval of this Proposal

With wording similar to the 2006 Park Commission approval of the concept for expanding managed meadows in the park system, the following motion could be adopted by the Park Commission:

A motion that the Park Commission supports the concept of providing basic management of all natural and undeveloped city-owned land, as outlined in the proposal reviewed by the Park Commission on 6/8/11. And that the Parks staff work with other City departments, volunteers and neighborhoods to implement a plan for basic management of all City natural areas.