City of Madison, Parks Division

Land Management Plan

Approved by
Habitat Stewardship Subcommittee
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Introduction

Goals and Strategies

The land management responsibilities of the Parks Division directly tie to strategies that have been outlined in various planning documents that have been adopted by the City of Madison Common Council. It adopted the Comprehensive Plan, Imagine Madison, in 2018 within which the Parks Division plays a critical role in delivering on the strategies that support a Green and Resilient city. This updated *Land Management Plan* supports the strategies such as:

- Acquire parkland and upgrade park facilities to accommodate more diverse activities and gatherings.
- Improve and preserve urban biodiversity through an interconnected greenway and habitat system.
- Develop a healthy and diverse urban tree canopy;
- Improve public access to the lakes.

In 2017, the Board of Park Commissioners adopted the Parks Division's previous *Land Management Plan*. That document described the framework within which vegetation is managed in developed parklands such as mini, neighborhood, and community parks; and in less developed, or undeveloped, open space parklands such as designated conservation parks and natural portions of the "general" parks mentioned above. Management of athletic fields is specifically addressed as well. The Parks Division created and continues to update its *Land Management Plan (Plan)* to provide a foundation to which staff, volunteers, and the community can refer when addressing the management and maintenance of vegetation in parklands, particularly in regards to athletic field standards, general turf management, weed management, and protection of pollinator species. City staff and community members charged with the stewardship of Madison's parklands have reviewed and provided input to the 2023 *Land Management Plan*.

The purpose of this document is to support the *Parks and Open Space Plan* by providing a framework and rationale for managing and stewarding the City's parklands. It facilitates clear communication with alders, board and commission members, neighborhood associations, friends groups, volunteers, donors, and the general public, when projects and maintenance requests arise. It provides a baseline for managing the park system, which can be built upon with more detailed, site-specific work plans, such as the Habitat Management Plans developed for individual parks and classes of managed meadows. Those plans can be implemented as opportunities arise and as capacity grows through increased public engagement. The *Plan* follows solid fundamental principles and should be used as the basis for routine and special projects completed on any City of Madison parkland, and will be reviewed and updated every five years by Parks Division staff and the Habitat Stewardship Subcommittee.

Sustainability and Adaptability

As a City, Madison is working to support sustainability by reducing dependence on fossil fuels and by working to sequester atmospheric carbon[1,2]. These actions help to slow or limit the human contributions to causes of climate change. Simultaneously, there is a need to adapt to conditions that are already occurring due to climate change. These include extreme weather events and increased storm water runoff, the effects of which often have inequitable impacts on the community. More broadly, climate-induced effects on ecosystem diversity and function must be mitigated to temper extreme changes in the ecosystem, of which humans are a part.

Actions supporting sustainability and adaptability often occur at different scales, and may seem at odds in a particular instance, but a broad view is required to measure the balance. While it is imperative to reduce our carbon emissions and increase carbon sequestration for sustainability, it is also necessary to adapt to the effects of climate change that are already impacting our environment and human

[1] https://www.cityofmadison.com/sustainability/climate
[2] https://www.cityofmadison.com/sites/default/files/news/attachments/climate_forward.pdf

community. Goals of re-forestation – or afforestation where native prairie, savanna and open woodland habitats no longer occur – are essential to slow the causes of climate change. However, artificial drainage patterns and erosion exacerbated by more intense storm events, may require removal of trees in some instances in order to establish stable bio-engineered infrastructure that relieves flooding in residential areas. Likewise, prescribed burning releases carbon into the atmosphere in the short term, but maintains biodiverse, resilient habitat for animals as well as for long-lived native prairie species with extremely deep root systems that sequester as much carbon below ground as trees do above ground.

The Board of Park Commissioners has proclaimed its commitment[3] to supporting pollinator health and has taken the Mayor's Monarch Pledge[4] to support pollinator health. The *Plan* reflects current knowledge and best management practices, anticipated capacity, and existing requirements per City ordinances and policies. Parks' approach to vegetation management is to employ sustainable practices that consider climate change and biodiversity, and adhere to the principles of integrated pest management and The City of Madison Pollinator Protection Taskforce Report to establish and maintain resilient landscapes and habitats.

The *Plan* also reflects the evolution of the Parks team, and indicates strategies that contribute to the overall health and sustainability of vegetation in parklands, whether turf, horticultural plantings, or native plant communities. The structure of the previous Land Management Plan document addressed "general" parks and conservation parks separately. This was appropriate for Parks' resources, approach, and operations structures at that time. This current document addresses vegetation types and relevant management with a system-wide approach. The methods used to manage vegetation are consistent across park designations, and increased cooperation and focus on ecological management and sustainability within the Parks Division are being applied across operational sections. To facilitate this, and to help develop detailed work plans, site specific Habitat Management Plans are used for conservation parks, managed meadow categories, and some larger woodlands. Work is to be conducted by trained staff, contractors, and volunteers.

Particular management strategies and goals may vary from site to site, based on the limitations or potential of the site, desired uses, and resources available. A high-quality remnant oak woodland in a conservation park may be managed to stricter performance standards than a hedgerow or fallow, former agricultural land in an undeveloped portion of a neighborhood park. Short term strategies may be more appropriate for the one, while a longer term approach may be the most effective use of resources - and still provide net ecological benefit - in the other. High quality turf with a uniform playing surface may be the standard for intensive management on an athletic field, while large, multiuse recreational areas may still support healthy turf with only weekly mowing and bi-annual aeration.

Weed and Pest Management

The Parks Division strives to maintain areas in adherence to this plan and in compliance with the City's Noxious Weed Ordinance (MGO 23.29). However, due to the amount of land managed and limited resources, it is not possible to completely eradicate all noxious weeds. As such, the Parks Division will promptly remove noxious weeds that are within 10 feet of all property lines, trails, paths and sidewalks where members of the public may potentially come in contact with the weeds indicated in the ordinance. Complaints or infractions will be brought into compliance within thirty (30) days of initial report.

For all other species of undesirable or invasive plants, the City of Madison's Policy Regarding Pest Management on City Property, including an Integrated Pest Management (IPM) strategy will be applied.

[3]https://madison.legistar.com/LegislationDetail.aspx?ID=6055008&GUID=C441FAB3-7733-4484-A2AF-852BAB061216&Options=ID%7CText%7C&Search=Pollinator&FullText=1

[4]https://madison.legistar.com/LegislationDetail.aspx?ID=5555151&GUID=8E5C6330-DD9A-4620-AC87-68A5A2357D4E&Options=ID%7CText%7C&Search=22-00300&FullText=1

IPM is a decision making process. The essential parts of IPM are monitoring, setting threshold levels for pests, identifying the causes of the pest problem, addressing the cause of the problem, and using the most effective, least harmful, methods to control the problem. IPM develops ways to change the conditions that cause the pest problem, so that pests will be prevented in the future or minimized. Control efforts consider the species' life cycle and population characteristics, site context, pre-determined action thresholds, and are followed by subsequent monitoring.

IPM is not an end unto itself, but a framework and strategy for responding to pests, and is employed in the greater context of managing a healthy, robust stand of vegetation (turf, prairie, forest, etc.) or a building or facility in a state of usability, energy efficiency, and good repair. Many of the objectives listed in the *Plan* are classified as "cultural" practices in the IPM framework, which promote robust, resilient stands of vegetation that are more resistant to weed establishment. This prevention is complemented by other objectives focused on containment of weed and other pest species, and practices that avoid introducing pests to new areas. Pest management is integrated into Parks' vegetation management practices described in the *Plan* below, specifically:

> Mechanical methods, including digging, pulling, cutting, mowing, and burning – both individual plants with a weed torch, and large areas with prescribed fire.
>
> Biological methods, including prescribed grazing and targeted release of approved organisms, such as flea beetles (*Aphthona* spp), loosestrife beetles (*Galerucella* spp), and root-boring weevils (*Cyphocleonus achates*).
>
> Chemical methods, including herbicide application to weeds. Herbicide and other pesticide applications will be made only by certified pesticide applicators

Parks is committed to minimizing the use of herbicides in vegetation management. The vegetation categories that occur in parklands are integral components of the broader landscape in the Madison area, and the Midwest. In this context, it is often necessary to prioritize or even tolerate certain naturalized or common pests, whether plants or animals, in certain settings.

Through the adoption of the *Plan*, the Board of Park Commissioners and its relevant subcommittees are emphasizing their commitment and support for these goals and maintenance standards, as well as the work efforts required to achieve them.

Turf

The park system (excluding golf courses) features 1,110 acres of regularly mowed turf - approximately one third of the area designated as “general” parks. Golf courses, consisting of approximately 750 acres of dedicated land for golf, add an additional 190 acres of mowed turf.

General turf (Lawns, open fields, and borders)

Turf areas that are finish-cut mowed multiple times per month during the growing season. This includes large open areas for general recreation, as well as smaller areas that border paths, parking lots, shelters, and other infrastructure.

Goals

- Establish and maintain turf grass quality that is sufficient for intended use. In high-use areas, this may include intensive management of hardy bluegrass stands. In areas with less traffic, or where large lawns are maintained primarily for aesthetics or views, this may include transitioning frequently mowed bluegrass stands to lower-maintenance fescue and other varieties that are more drought and heat resistant, and that require only annual mowing.
- Prevent soil compaction and erosion.
- Favor mowing and cultural practices that discourage weed growth.
- Improve the sustainability of turf management. This may include transitioning some areas to managed meadows and other non-turf vegetation.
- Mitigate organic material in storm water runoff and sewers as much as possible.

Objectives

- Cut to height of 3 - 3.5 inches, which is the ideal height for cool season turf grasses.
- Mow turf on approximately 10-15 day cycles, or as necessary to maintain cut height. Mow more frequently during fast growth, less frequently during slow growth.
- Double-cut in perpendicular directions if needed to shred and disperse clumps that form when cutting taller or wet grass.
- Sharpen mower blades weekly.
- Fill ruts with topsoil and sow seed as needed to fill bare spots.
- Aerate to relieve soil compaction and improve infiltration.
- Over-seed as needed to promote thick turf and infuse heartier drought tolerant varieties.
- Follow established cultural practices to limit weed dominance and over-seed areas of poor turf cover.
- Transition to electric and automated mowing equipment where feasible as determined by Parks Operations.

Best Practices

- Grass grows very fast earlier in the season, and may require cutting several inches off the blade. Later in the season, when growth is steadier, strive to remove no more than 1/3 of the grass blade.
- Mow athletic fields when dry to reduce amount of clumping. Mow later in the day than the surrounding park, if possible, to allow dew to evaporate and grass to dry.
- Allow clippings to remain on the turf, and use mulch plates on mower decks when possible.
- Mulch and recycle grass clippings in place to the greatest extent possible. As deeded needed by Parks reduce excess amounts that will be too thick for grass to grow and in densely shaded spaces that have weak turf conditions.
- Clean mower decks and check for damaged blades daily.
- Avoid mowing when turf is under extreme heat or drought stress
- Avoid mowing when soil is saturated or excessively wet or soft.
- Avoid driving on frost-covered or frozen turf.
- Utilize various strategies to reduce and/or remove grass clippings from hard surfaces, including coordinating with the Streets Division to sweep behind mowing operations.

Athletic Fields (baseball and softball diamonds, soccer fields, football fields, cricket pitches, golf courses)

Reservable playing fields intended for organized competitive sports. These areas are managed to higher standards to provide safe, regulation-compliant sport facilities.

Golf courses include Yahara Hills Golf Course, Monona Golf Course, The Glen Golf Park, and Odana Hills Golf Course. Each course has a nutrient and turf management plan tailored to each type of turf (greens, tees, fairways, and rough). Refer to the golf course specific management plan for care of the courses.

Goals

- Establish and maintain turf suitable for player safety and proper execution of scheduled sporting events at the intended level of competition.
- Manage turf to resist wear and recover quickly.
- Adhere to minimum thresholds for turf quality and implement corrective actions once the threshold is reached. These thresholds and action steps will vary based on numerous factors such as the location of the athletic field (neighborhood park versus an athletic venue), field requirements of the sport, the athletes playing upon it, fees paid by participants, and funds available for actions required.

Objectives

- Staff will follow the objectives above for “general turf”, for regular mowing, aeration, and turf repair.
- In addition, athletic fields will receive applications of fertilizer and wetting agents (as needed) to promote regrowth, wear tolerance, and weed control to maintain playable and resilient playing surfaces.
- Use a field rotation schedule to ensure that wear from heavy use is distributed to all fields, and to allow rest periods for turf to recover. This will prolong the health of the field and reduce the resources needed to completely refurbish a badly worn field.
- Consult with volunteers and user groups to determine field rotation schedules that balance users’ needs and turf health. Secure funds for improved maintenance and periodic field renovations.
- Close fields during periods of extreme wet, drought, and heat. This will not only protect player safety when fields are muddy or excessively hard, but will also protect the turf from damage. Parks staff will close fields as conditions warrant, and update user groups in coordination with the Athletic Scheduler.

Hardscapes

Hardscapes include parking lots, sidewalks, paved areas around shelters, stone structures on waterfronts, and approximately 51 miles of paved paths. These areas are maintained to remain free of debris and encroaching vegetation.

Goals:

- Provide neat, clean edges around parking lots, paths, benches and other facilities and structures.
- Provide open, unrestricted access to sidewalks and park features.
- Extend life of pavement by removing vegetation and debris from cracks.

Objectives:

- String trim or torch weeds growing in cracks and along edges of sidewalks, steps, curbs and other joints between hard surfaces.
- Sweep pavement with mechanical sweepers (used primarily at the State Street - Mall Concourse)

Best Practices:

- Blow trimmings and debris off of pavement and onto adjacent turf

- Utilize various strategies to reduce and/or remove grass clippings from hard surfaces, including coordinating with the Streets Division to sweep behind mowing operations where necessary on medians. This can also include rear discharge mowers.

Parks has started to transition some of its gasoline-powered small equipment such as string trimmers, blowers, and chainsaws, to battery-powered electric equipment, and will continue to do so as technology, cost, and resources support the change.

Landscape Beds

Landscape beds include decorative plantings around park signature signs, shelters, and other park facilities and features. These areas are important for accenting parks and creating a welcoming space for users. Staff develop and implement annual work plans for beautification projects aimed at creating, updating or renovating beds and plantings with the goal of reducing the amount of maintenance required while maximizing aesthetics. Routine maintenance is performed on a rotating schedule. Beds are maintained periodically, and certain tasks are not necessarily conducted annually.

In support of climate resiliency and sustainability, greater emphasis is being placed on selecting and planting a high proportion of species native to southern Wisconsin. While the traditional aesthetic of a formal garden stocked with introduced horticultural varieties has its place, landscape beds throughout the Parks system provide an important network of natural habitat to complement large areas of turf and park facilities. Carefully selected native species provide the same aesthetic qualities of color, texture, and bloom time as traditional introduced species while promoting a more sustainable developed landscape. This helps support the City's goals of sustainability and pollinator protection on the 6,000 acres of parklands interspersed throughout the approximately 100 square miles within the City limits.

Goals

- Provide an engaging and aesthetically pleasing focal point to formalize park entrances and features and create a sense of place.
- Establish and maintain colorful displays that feature interesting and complementary textures and structures.
- Provide color and blooms throughout the growing season.
- Increase the quality and diversity of habitat for native insects and other wildlife.
- Document standards for landscape bed appearance, performance and maintenance.
- Continue to reduce the climate footprint and resources required to maintain landscape beds.

Objectives

- Perform pre-season maintenance in spring, including cutting - and where necessary, removal - of dead vegetation from the previous growing season, and application of pre-emergent herbicide in selected beds. Long-term overall goal is to establish dense plantings that reduce weed establishment and the need for pre-emergent herbicides.
- Select native plant species to accomplish aesthetic goals while providing habitat for native pollinators.
- Cut or hand-pull weeds throughout the growing season; apply herbicide to perennial or hard to control species.
- Prune shrubs as needed in fall and winter.
- Actively recruit volunteers to support maintenance of landscape beds and plantings.
- Secure agreements with volunteers for "adopted" landscape beds, similar to Parks agreements for volunteer installed or maintained features such as bird houses and art displays.

Best Practices

- Select and plant native species whenever possible.
- Avoid using plant species and varieties that spread aggressively.
- Minimize use of bark mulch.

- Allow vegetation to remain in place through the dormant season to allow plants to re-seed.
- Allow dead herbaceous vegetation and leaf litter to remain standing in place in the fall to provide overwintering habitat for native pollinators and other wildlife.
- For pre-season maintenance, mow beds in spring with a rough-cut mower, such as a walk-behind brush mower. Allow leaf debris to remain in place as natural mulch, which will then build soil.
- Reduce the use of pre-emergent herbicides. This will require increased volunteer support to mulch and hand-weed new beds that are becoming established.
- Avoid tilling where possible when establishing, renovating or restocking beds with growing stock.
- Pilot ultra-low maintenance landscape beds, such as gravel gardens, in situations that are more challenging to maintain.

Managed Meadows

The 2017 *Land Management Plan* identified "Meadows" as one of the major vegetation types in Madison's parks, characterized by non-wooded, non-turf, open space. Meadows were previously divided into two classes: Bluegrass-dominated No Mow Meadows, and Prairie Managed Meadows.

With an increased focus on sustainability and climate resilience, Parks' vegetation management approach has evolved to manage this non-turf open space with a goal of increasing native plant diversity, pollinator habitat, ecosystem function, and ecosystem services. "Meadows" are now more accurately called "Managed Meadows" and are divided into three tiers based on plant diversity and restoration potential. Management priority for individual meadows is driven by the quality tier assigned to the meadows, staff and budget capacity, as well as the Park Master Plan for a given park. There are currently more than 250 acres of managed meadows in the system.

- Tier I Managed Meadows (*highest quality*) are characterized by high native plant diversity and relatively small to moderate populations of invasive plants. These generally include the formerly-named "Prairie Managed Meadows" that had been intentionally planted with native wildflowers. These are well established plantings that are generally at least five years old. Examples can be found at Raymond Ridge Park and Reston Heights Park.

- Tier II Managed Meadows (*medium quality, with potential for improvement*) are characterized by moderate to high native plant diversity, but with more sizable invasive plant populations OR areas that are lower in native plant diversity, but which also have relatively small to moderate populations of invasive plants. These typically include older plantings that have declined in quality over time, more recent plantings that are just becoming established, and some bluegrass-dominated areas that have become naturalized and include colonies of native species and relatively smaller populations of invasive plant species. This latter group often has an "old-field" quality in terms of plant species composition and wildlife habitat provided. Examples can be found at Garner Park, Junction Ridge Park, and Secret Places Park.

- Tier III Managed Meadows (*low quality*) are characterized by very low native plant diversity and often contain large populations of invasive plants. These typically include the formerly-named "Bluegrass dominated No-Mow Meadows" or "Low-Mow Meadows". Many of these areas had been maintained as turf in the past, but later allowed to grow fallow as Parks reduced its acreage of frequently mowed turf. Examples can be found at Cherokee Park and Waltham Park.

  Some current Tier III Managed Meadows areas are fallow and simply being reserved for future development. These areas are maintained to remain free of woody growth through periodic mowing. These would be good candidates for transition to low-maintenance fescue stands that would maintain herbaceous cover while helping to limit the establishment and spread of invasive species into and from these areas.

Other Tier III Meadows are good sites for potential afforestation, which would increase wildlife habitat value and provide carbon sequestration, shading and sound attenuation in the urban landscape.

Goals

- Increase the quality and diversity of habitat for native pollinator species.
- Provide winter habitat (cover) for insects and small mammals.
- Provide effective, long-term control of invasive plant populations.
- Limit growth of woody species to maintain open space dominated by herbaceous species.
- Provide areas that maximize infiltration of precipitation and reduce runoff, especially in the context of developed, turf-dominated parks.

Objectives

Tier I Meadows

- Conduct prescribed burns every three years, rotating sites to burn only 1/3 of all Tier I sites in a given year, to conserve habitat space for fauna.
- Control woody species to prevent significant increases in dominance, as measured by percent cover every three years.
- Control annual, biennial and perennial invasive plant species annually, with very low tolerance, working to minimize their presence. This may include hand-pulling, cutting or digging scattered individuals, or spot mowing or spot spraying with herbicide for larger infestations.

Tier II Meadows

- On select sites, conduct prescribed burns every three years, rotating sites to burn only 1/3 of all selected Tier II sites in a given year.
- Control woody species to reduce dominance, as measured by percent cover every three years.
- Control annual, biennial and perennial invasive plant species annually with higher tolerance, working to suppress populations in the short term, and reduce populations in the long-term. This may include spot mowing or spraying with herbicide.

Tier III Meadows

- Spot mow sites annually to prevent growth of woody species.
- Control noxious weeds and highly invasive plant species, working to suppress populations and prevent their spread off-site.
- Convert large monocultures of reed canary grass, bird's-foot trefoil and Canada thistle to turf to mitigate their impact on adjacent areas and the broader landscape.

Best Practices

- Use mechanical methods such as hand-pulling and mowing on annual and biennial species where practical, based on labor capacity and plant abundance. Some examples include sweet clover, wild parsnip, and some thistles.
- Time mowing to occur when plants are most vulnerable, in the seedling or blooming stages, but before seed set.
- Avoid mowing target species after seed set to prevent spreading weeds across greater areas or to other sites.
- Avoid mowing large areas (>0.5 ac) during breeding season for ground-nesting birds, typically between May 15 and July 31.
- Mow or cut perennial or particularly aggressive species to force re-sprouting before applying herbicide, in order to weaken plants end ensure efficacy. Examples include crown vetch and Japanese knotweed.

- Incorporate biocontrol where possible. Parks currently uses flea beetles to control leafy spurge. Approved biocontrol species are also available for purple loosestrife and knapweed, and may be released as well.
- New prairie plantings will be mowed to a height of 6-8” at least twice during the first two growing seasons.
- Tolerate some native shrub species to increase habitat diversity, but do not allow woody plant cover to exceed 25% in a managed meadow unit.
- Evaluate habitat diversity and proximity in the context of the entire site.
- Install and maintain interpretive signage to explain the function and management of managed meadows.

Tallgrass Prairie and Oak Savanna

Prairies, savannas, and woodlands were once the dominant vegetation types throughout much of the Midwest. These fire-adapted natural communities transitioned into each other as fires managed by Native Americans burned with different intensities across different expanses of the landscape. European settlement and related policies interrupted this process, and subsequent fire-suppression, habitat fragmentation and conversion of land to large-scale agricultural, residential and industrial uses resulted in a decrease in the prevalence of these vegetation types as well as a reduction in biodiversity. Land managers who steward prairies, savannas and woodlands must now choose with more precision, within the context of political and ownership boundaries, those sites with high potential to establish or re-create prairie and savanna structure and species composition.

In the park system, these vegetation types are primarily found in larger park units that had formerly been used for agriculture, or in some instances, contain remnants of natural communities that had not been converted to other land uses or vegetation types since European settlement.

Goals

- In prairies, re-establish and maintain a native, herbaceous-dominated grassland community with minimal cover of native shrub species dispersed throughout the unit.
- Increase diversity in older prairie plantings dominated by warm season grasses.
- Minimize non-native cool-season grass cover.
- Limit the spread and reduce populations of invasive herbaceous plants (ie. reed canary grass, wild parsnip, teasel, sweet clover, non-native thistles, etc.) to avoid rapid invasion of degraded prairie habitat.
- Allow or augment colonization of some prairie areas by bur oak and other fire tolerant species to increase structural diversity and allow for future development of savanna habitat.
- Use climate adaptive strategies like assisted migration. Incorporate species for which southern Wisconsin is currently the northern limit of their range. Plant and promote species that are native to southern Wisconsin and northern Illinois, but that are currently more dominant in southern and central Illinois and northern Missouri.
- Manage for heterogeneous habitat cover that promotes gradients and mosaics of native grassland, shrub and tree cover.
- Monitor invertebrate populations. Provide refuges and stagger treatments to retain individuals and allow for re-colonization of management units in order to sustain populations at a given site.

Objectives

- Inter-seed former agricultural fields and areas dominated by non-native cool-season grasses with diverse native prairie seed mixes. In some cases, the existing non-native plant community will be treated with herbicide first. Work may be performed by staff, volunteers or contractors.

- Seed installations will be followed by establishment mowing. Following seed installation, staff will mow prairies to a height of 6-8", two to three times during the first two growing seasons to control weeds and reduce competition for native seedlings.
- Use mowing and limited herbicide treatments to help control woody and herbaceous weed species. Mowing will be carefully timed to ensure effectiveness when targeting individual weed species. Attention will be paid to reducing seed production, preventing further growth and avoiding seed dispersal.
- Maintain tallgrass prairies with regular prescribed burns, on a 3-year (maximum) return interval. Efforts will be made to avoid burning particular burn units repeatedly during the same time of year, in order to minimize disproportionate or negative effects on different suites of species (i.e. warm-season grasses or forbs).

Best Practices

- Use mechanical methods such as hand-pulling and mowing on annual and biennial species where practical, based on labor capacity and plant abundance. Some examples include sweet clover, wild parsnip, and some thistles.
- Time mowing to occur when plants are most vulnerable, in the seedling or blooming stages, but before seed set.
- Avoid mowing target species after seed set to prevent spreading weeds across greater areas or to other sites.
- Avoid mowing large areas (>0.5 ac) during breeding season for ground-nesting birds, typically between May 15 and July 31.
- Mow or cut perennial or particularly aggressive species to force re-sprouting before applying herbicide, in order to weaken plants end ensure efficacy. Examples include crown vetch and Canada thistle.
- Incorporate biocontrol where possible.
- Allow snags (standing dead trees) to remain standing and decay naturally where they do not pose a threat to trails and infrastructure. Park's Snag Protection Policy will be employed when conducting large-scale restoration work in savannas.

Urban Forest

Madison's urban forest is a crucial asset for ensuring climate resilience. However, its current health, structure and composition are the legacy of multiple waves of pests, tree diseases, management decisions, and current practices. The City has demonstrated the value it places on the urban forest by maintaining Tree City USA and Bird City Wisconsin certifications. Within parklands, the components of this forest can be classified and managed at three levels:

- *Individual trees* include isolated shade and ornamental trees planted or naturally occurring throughout the park system.

- *Groves* refer to defined stands of trees that have sometimes been planted, but are often naturally occurring and a result of previous land uses. These groups of trees have been retained to present day, and often define the character of a particular park. Examples include the even-aged stands of oaks at Arbor Hills Park, Goodman Park, Lake Edge Park, and Worthington Park; and stands of cottonwoods at Warner Beach. These areas often feature mowed turf or an herbaceous dominated understory free of woody undergrowth, and therefore, a lack of stand regeneration capacity, i.e. no young trees to replace older ones as they die.

- *Woodlands*, used broadly here, include denser plant communities dominated by woody species, and often characterized by a dense shrub canopy and herbaceous understory. The health and robustness of the herbaceous plant community varies based on past land management practices and the abundance of invasive shrubs such as buckthorn and

honeysuckle. Examples are found throughout the conservation parks and wooded portions of many other parklands such as Door Creek, Elver Park, Garner Park, Vilas Park, and Warner Park. The recognized ecological community types range from open oak woodland, to dry-mesic oak-hickory forest, to mesic deciduous forest dominated by maple, hackberry, basswood, cherry, elm, walnut and other species. There are currently about 1,000 acres of woodlands in the park system, including 550 acres in general parks, and 440 acres in conservation parks.

Goals

- Preserve the health of individual trees, especially signature trees.
- Prevent the spread of tree diseases and pests. Increase direct tree health interventions, such as treatments to prevent and mitigate spongy moth infestations, and oak blight and oak wilt infections.
- Ensure regeneration of the urban forest, particularly groves in certain parks, and oaks as a species component of woodlands in general.
- Delineate, inventory, and prioritize groves and woodlands in the parks system. Develop management plans for select woodland units in general parks using a tiered approach similar to that used for managed meadows. Woodlands in conservation parks are addressed in conservation park habitat management plans.
- Increase the quality and diversity of tree species in the urban forest as a whole, in order to improve disease resistance and habitat for native pollinator species, birds, and other wildlife.
- Provide winter habitat (cover) for insects and small mammals.
- Provide effective, long-term control of invasive plant populations.

Objectives

Individual trees

- Identify high-value signature and specimen trees and transition from mowed turf to mulch and herbaceous plantings within the drip line. This will ease soil compaction and decrease stress on the tree root system. In some cases, air-spading may be required to mitigate highly compacted soil.
- Conduct regular structural pruning on newly-planted trees to ensure strong individual tree structure. Pruning should occur on three-year rotation.

Groves

- Transition from even-aged groves to uneven-aged stands in order to retain the function and character these areas provide. Actively plant replacement trees as over-mature individuals are removed for public safety or succumb to disease.
- Determine desired species composition for groves, when planning for under-planting and stand replacement. Consider the ability of different species to succeed in this setting. For example, oaks are particularly sensitive to soil compaction and will not perform as well in a grove that is underlain by turf. Likewise, diverse, rather than monoculture, stands are more sustainable and resilient to outbreaks of major species-specific threats such as Dutch Elm Disease and Emerald Ash Borer.
- Define and identify significant stands of trees, establish project areas, and develop plans to transition ground cover in groves from mowed turf to native plantings that require less frequent mowing or can be maintained with prescribed burning. Olin Park provides an example of this. Arbor Hills Park provides an opportunity for this. Plans would be implemented with capital improvement funds or other sources.

Woodlands

- Promote survival of canopy dominant and desirable sub-canopy trees by thinning and reducing competition in overcrowded stands.
- Ensure the retention of oak as a species component in oak dominated woodlands. In stands dominated by more mesic deciduous forest species, ensure the retention of species richness to maintain a sustainable forest that provides high value to wildlife.

- Ensure regeneration, particularly of oaks, in stands with closed canopies by removing invasive shrub understories, daylighting suppressed individuals, and selecting for future canopy dominants.
- Remove invasive and non-native plant species (trees, shrubs, vines grasses and forbs). Control small populations of exotic shrubs and vines with cut stump, kerf, and basal bark herbicide treatments.
- Conduct prescribed burns where possible in stands containing oak or hickory.
- Retain diverse native shrub component in understory.
- Restore and maintain native herbaceous ground layer. Plant seed mixes and individual plants as appropriate.
- Retain standing dead trees where safe and practical, to maintain habitat for insectivores, native bee and wasp species, and cavity-nesting species.
- Retain sufficient downed woody debris. This habitat feature is extremely important for the survival and reproduction of numerous plants, insects, and small mammals. Restoration efforts enabling safe, effective, prescribed fire management follow specifications detailing minimum numbers and dimensions of downed woody debris that will remain.
- Develop and implement habitat management plans for significant woodland units as capacity allows.

Best Practices

- Clean equipment, tools and footwear before entering and upon exiting worksites to prevent spread of invasive plant and animal species.
- Use “Early Detection/Rapid Response” to monitor and control new populations of invasive species.
- Work to limit seed production in extensive populations of perennial species such as buckthorn. This strategy can eventually reduce the viable seed bank and improve the success and efficiency of future understory restoration efforts.
- Conduct forestry mowing primarily during the dormant season, and only when soil is dry or frozen. Hand cutting may occur in late summer through winter until trees begin to break dormancy.
- Favor cut-stump treatments over foliar herbicide applications to control re-sprouts of woody species. Consider mowing or grazing to reduce woody stem density following large scale clearing operations such as forestry mowing.
- Use basal bark applications of herbicide in bark oil rather than cutting to control smaller (< 6 inches diameter) black locust, in order to avoid triggering the species’ prolific root suckering response[5].
- Where long-term maintenance will include prescribed fire, seed and establish graminoids (grasses and sedges) to increase fine fuel loading as soon as practical to promote prescribed burn efficacy.
- Conduct outreach and install signage in community parks to educate public about tree health and management.
- Allow snags (standing dead trees) to remain standing and decay naturally where they do not pose a threat to trails and infrastructure. Park’s Snag Protection Policy will be employed when conducting large-scale restoration work in woodlands.
- Consult DNR Forester, ecologists, and other experts to help develop silvicultural and habitat management plans for woodland units of significant size (>20 acres).

Woodland Edges

Turf stands, landscape beds and managed meadows are usually characterized by hard, well-defined edges. The edges of groves and woodlands in the system are less well defined, and require flexibility to ensure tree health and limit the establishment of invasive species. Trees and shrubs encroach into the

[5] https://mdc.mo.gov/trees-plants/nuisance-native-plants/black-locust-control

edges of turf, making it difficult to mow weekly. In addition, the increased shade along woodland edges limits the vigor of the turf grasses and facilitates establishment of weed species. The woodland suffers from the edge effect as well. Birds disperse weed seeds as they perch on trees on the edges of turf areas, and the increased light levels extend into the woodland, allowing some invasive and native edge species to outcompete woodland interior species. In conservation parks and larger woodlands in general parks, there is opportunity to soften this edge and promote a more natural transition with a gradient of native species adapted to the range of light levels. This would be accomplished primarily through selective cutting, prescribed burning, and some planting of native shrub and herbaceous species.

Goals

- Maintain an accessible transition zone between woodlands and adjacent vegetation types that has a robust native plant community with few invasive species.

Objectives

- Periodically (annually or biennially) brush mow and prune transition zones along the turf-woodland interface to control woody species encroachment.
- Conduct prescribed burns on 3-year return cycle, either alone or in conjunction with periodic mowing.
- Identify potential future canopy dominant trees that could be retained, released, and pruned high to minimize shading and maximize access in the transition zone.
- Identify and prioritize populations of invasive species that can be controlled and replaced with native plant establishment or augmentation. Develop work plans for staff, contractor or volunteer implementation.
- Promptly respond to potential tree hazards by assessing the hazard and prioritizing the work as deemed required by Parks.

Wetlands and Waterfronts

Waterfronts

Within the Park system, there are more than 18 miles of shoreline along Madison's lakes, lagoons, creeks, and rivers. These are managed to provide opportunities for recreation and enjoyment, while protecting the resources on either side of the waterline. Waterfront areas include:

- *River and lake shorelines* - Namely, parkland along Starkweather Creek, the Yahara River, and Lakes Mendota, Monona, and Wingra. Hardened shorelines are designed and managed by the City Engineering Division. Land above the ordinary high water mark is maintained by the Parks Division.

- *Lagoons, ponds, and rain gardens* - Lagoons are prominent features of Tenney, Vilas and Warner parks. They are unique urban natural areas that provide quiet water and naturalized shorelines adjacent to park amenities that allow for active and passive recreation. Some ponds located in parks and golf courses are part of the City's storm water greenway system, and are managed exclusively by or in cooperation with the Engineering Division. Vegetation within the basin may be maintained by Engineering, while Parks maintains the vegetation surrounding the basin. Rain gardens are located throughout the system.

- *Beaches* - Madison Parks maintains twelve beaches throughout the city. Water quality is monitored between Memorial Day and Labor Day by Public Health Madison and Dane County.

Goals

- Prevent shoreline erosion.
- Reduce runoff, sedimentation, and nutrient loading into water.
- Regulate movement of geese and other waterfowl from water onto land to direct waterfowl away from areas frequently used by humans.

- Temporarily protect turtle and water fowl nests when discovered during nesting season.
- Allow park users clean, safe access to water.

Objectives

River and lake shorelines

- Install and maintain buffers of native vegetation on uplands adjacent to shorelines.
- Where park master plans include access and views of the water, shoreline vegetation will be periodically cut or burned to control woody species. Prescribed burns will be used where possible to control woody stems while maintaining diverse native herbaceous cover.
- Work with Dane County to maintain navigable channel at Olbrich launch in Starkweather Creek.

Lagoons and ponds

- Install and maintain buffers of native vegetation on uplands adjacent to shorelines.
- Establish native emergent plants along the littoral zone to reduce shoreline erosion. Possible locations would be Tenney, Vilas and Warner lagoons.
- Work with Dane County and City Engineering Division to dredge lagoons as needed to proactively maintain the depth and function of the water feature.
- Monitor muskrat and beaver populations, and control as needed to prevent erosion and damage to trees and waterfront infrastructure such as bridges, trails and canoe launches.
- Allow aquatic vegetation to remain during the growing season to maintain habitat for fish and amphibians. Cut aquatic weeds in the fall where necessary to prepare the water column for quality ice establishment for skating, for example, portions of Vilas lagoon.
- Where needed for winter recreation, mow vegetation along the shoreline annually to control woody plant growth and facilitate access for ice maintenance. Use prescribed burns where possible to control woody stems while maintaining diverse native herbaceous cover.

Beaches

- Re-nourish sand above the ordinary high water mark per DNR requirements
- Grade beaches to resist erosion from wave action and storm water runoff.
- Clear debris and groom sand at least weekly between Labor Day and Memorial Day.
- Install and maintain devices such as predator decoys and automatic lights to deter Canada geese from roosting on beaches at night.

Best Practices

- Use “Early Detection/Rapid Response” to monitor and control new populations of invasive species.
- Use manual methods such as cutting, digging and hand pulling to control weeds where possible.
- Apply anthraquinone-based repellant to deter Canada geese from grazing on turf adjacent to water bodies.
- Post signs to educate the public, and enforce MGO 8.42, which prohibits feeding any bird on City property.

Wetlands

Within the system there are also more than 1,000 acres of wetlands ranging from emergent marsh to sedge meadow to shrub carr. In some wetlands, large areas may be dominated by monocultures of invasive species such as reed canary grass or hybrid cattail. Resources will be directed to prioritize restoring and maintaining higher quality wetlands, while containing these species to the more severely degraded areas and preventing their spread. As opportunities arise, for example, with the installation or redesign of storm water infrastructure such as greenways and ponds, efforts will be made to re-establish a diverse native plant community as the effects of past hydrological alterations are corrected in the area. In conservation parks and other natural areas, previous alterations such as ditches and drain tiles may be plugged or removed to restore a more natural hydrology.

- *Emergent Marsh* - Shallow water areas on edges of lakes, ponds, rivers and streams that support emergent aquatic vegetation.

- *Sedge Meadows* - These include higher quality wetlands with saturated soils and some standing water, dominated by graminoid species, mostly sedges. This vegetation type can be found in conservation parks, some general parks, and some storm water greenways.

- *Shrub carr* - Shrub carr is an important habitat for birds. Good examples exist at Cherokee Marsh Conservation Park and Warner Park.

Goals

- Re-establish and maintain diverse native plant communities characterized by appropriate structural diversity and a rich species composition. Emergent marsh should contain a heterogeneous structure, with areas of taller and shorter stature plants, as well as areas of dense cover and open water. Sedge meadow should have minimal cover of native shrub species scattered throughout the unit. Shrub carr should have a diverse native woody species composition including but not limited to alder, dogwood, willow, and poison sumac.
- Limit the spread and reduce populations of invasive plants such as buckthorn, bush honeysuckle, common reed, hybrid cattail, purple loosestrife, and Japanese knotweed.
- Limit and mitigate hydrological disturbances as much as possible.

Objectives

Emergent Marsh

- Control non-native invasive species with pulling, cutting, or herbicide treatments as appropriate.
- Collaborate with Engineering Division in conservation parks to manipulate water levels to facilitate larger-scale mechanical control of invasive plant populations, and establishment of native plant species.
- Install native emergent plant species along the shore of newly constructed ponds. Protect new plantings from geese and other herbivores.
- Large stands of native species such as American lotus may be complemented by establishing additional native emergent species adjacent to these areas.

Sedge Meadow

- Restore hydrology by de-activating artificial drainage systems such as ditches where possible.
- Control woody and herbaceous invasive species. Staff, volunteers and contractors will use hand-pulling, cutting, and targeted herbicide treatments such as cut-stump and wick bar applications to control species such as common reed, hybrid cattail, and purple loosestrife.
- Control small, isolated patches of reed canary grass to prevent spread. Consider removing larger monocultures if resources allow for proper follow-up and re-establishment of native plant community. Extensive monocultures should be tolerated, but contained, and seed production suppressed if possible.
- Install native seed mixes and native plant plugs in areas that have recently been cleared of invasive species or brush.
- Discourage use by resident Canada Geese.
- Conduct regular prescribed burns on a 3-year (maximum) return interval.

Shrub carr

- Control invasive species such as buckthorn and honeysuckle. Staff, volunteers and contractors will use hand-pulling, cutting, and targeted herbicide treatments.
- Conduct regular prescribed burns on a 5-year (maximum) return interval to promote native shrub regeneration and control fire-intolerant species such as ash, boxelder, and elm that may become established and dominate the community.

Appendices

Appendix A. Snag Protection Policy
Appendix B. Wildlife Management Policy