



WOODLAND PARK AND NATURE PRESERVE

LAND MANAGEMENT PLAN

OCTOBER 2011

Written By: Landscape Architects & Planners, Inc.
In Collaboration with:
City of Battle Creek
Woodland Park Foundation Committee and Board



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Introduction

Background

In 2011, the Woodland Park Foundation Committee (WPFC) received a Capacity Building Grant from the Battle Creek Nonprofit Alliance. WPFC coupled that grant with support from the Battle Creek Parks and Recreation Department and its own WPFC resources to fund the effort to develop the Land Management Plan (LMP). The purpose of the grant was to build capacity of Woodland Park Foundation Committee (WPFC) while preparing a Land Management Plan (LMP) for Woodland Park and Nature Preserve (WPNP). The LMP is a guide for the management and improvement of the natural habitats and educational opportunities available for the WPNP and the Battle Creek Parks and Recreation Department over the next 5 years.

The Battle Creek Parks and Recreation Department supported the Woodland Park Foundation Committee's proposal to seek funds to complete a LMP to manage the natural habitats of Woodland Park and Nature Preserve. The LMP will be congruent with and supportive of the Master Site Plan for Woodland Park that was adopted on June 20, 2006 by the City Commission. Citizens attending focus groups during the process overwhelmingly recommended keeping the Park a passive recreation area where individuals and families could experience the beauty of wooded areas, wetlands, and open meadows. Improvement projects would focus on developing the Park's natural beauty. Several capital improvement projects were identified in the Master Site Plan, but there were no plans included for managing the land of the Park.

The LMP project started in May of 2011 with the solicitation and award of a consultant possessing experience with land management, natural ecosystems, volunteer programs, environmental education and interpretation, and funding methods. In June of 2011, Landscape Architects & Planners, Inc. (LAP), the selected consultant, completed a site evaluation with members of the WPCF to inventory and gain an understanding of existing conditions, issues and opportunities and recent history of the site. Additional background research was collected including historic, geological, soils, and native habitat data. In early August of 2011 an initial presentation was done with the WPFC for review and input and in Mid-August a presentation was done for the Woodland Park Foundation Committee Board of Directors. A draft document was completed and presented to the WPFC Board in September of 2011. The Plan was presented to the Battle Creek Planning Commission in November of 2011 and in December it was presented to the Battle Creek City Council for adoption.

The report includes basic information about the Woodland Park Foundation Committee including their vision, mission and organizational structure. For additional background on the formation and activities of the WPFC a brief timeline is provided in the appendix. The inventory and analysis looks at what data and resources were used to study the land and develop the Land Management Plan,



Education Program and 5-Year Action Plan. A Reference Manual was created as a separate document and provided to the WPFC. The primary purpose of the Manual is to provide more detailed information related to the long-term management of Woodland Park and Nature Preserve. The Manual includes information about grant sources, invasive plant control, successional woodlands, prairie restoration, forests and plant material sources.

Vision and Mission

Vision Statement

Woodland Park and Nature Preserve offers the opportunity for users of the Park to actively participate in the enjoyment and appreciation of nature and engage in environmental stewardship.

Mission Statement

To promote, improve, and protect Woodland Park as a nature preserve for all citizens to view and enjoy.

Organizational vision, mission, programs and services provided with priorities.

Programs and Services with Capital Improvement Priorities

1. Facilitate an active lifestyle through the use and enjoyment of Woodland Park and Nature Preserve.
 - Capital Improvement Priorities
 - a. Identification signs
 - b. Stream crossing (bridge/boardwalk) (observation deck)
 - c. 12' multi-purpose pathway
 - d. Gethings/Helmer trailhead barrier free loop
 - e. Development of trails according to the WPNP Site Master Park Plan.
 2. Engage in environmental stewardship – *Preserve the 145 acres of Woodland park as a green space and restore special habitats.*
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 - Capital Improvement Priorities
 - i. 6' wetland boardwalk/observation deck
 - ii. Meadow restoration
 - iii. Develop invasive species eradication program
 - b. Establish an environmental education program for students and adults

Committee Structure

Since 2006, the Woodland Park Foundation Committee (WPFC) has been a community-based, all-volunteer organization whose mission has been to promote, protect, and improve WPNP. The WPFC acts as a nonprofit under the 501 (C) 3 umbrella of the Battle Creek Community Foundation



where the WPFC Endowment and Community Development Projects Funds are held. The WPFC collaborates and partners with the Battle Creek Parks and Recreation Department as a “Friends of Woodland Park” group on projects of mutual interest.

The purpose of the Advisory Council (Committee) is “to provide the leadership and organization to maintain, improve, protect and preserve Woodland Park and Nature Preserve for all citizens in the Battle Creek area.” Their role is to support the WPNP through activities such as fund raising, environmental education, resource management, maintenance, operations and natural habitat improvement and preservation. They are overseen by the Woodland Park Board.

The WPNP Foundation Committee Board of Directors is elected by the Advisory Council. Their function is to establish policy and make financial decisions on behalf of the Advisory Council. Woodland Park and Nature Preserve is owned by the City of Battle Creek.



Woodland Park Foundation Committee Organizational Structure

City of Battle Creek



Battle Creek Parks and Recreation Department



Woodland Park Foundation Committee Board of Directors

Joyce Garrett, President
William Morris, Vice President
Deborah Owens, Treasurer



Dwight Grandgenett, Corresponding Secretary
Diana Cole, Reporting Secretary

Woodland Park Foundation Committee

Steve Barker
Randy Champlin
Diana Conant
Gary Dodd
Rita Grandgenett
Phyllis Heaberlin
Stacy Hibiske

Gert Hickman
Roshan Karamchandani
Betty Kreiter
Cathy Kreter
Susan Scalabrino
Mike Troutman

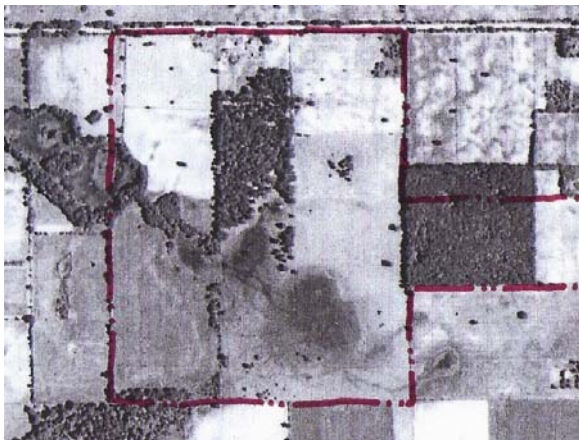


Inventory and Analysis

History

In the late 1800's, a topographic survey was completed for the Public Land Survey in the location of Woodland Park and Nature Preserve (WPNP). According to the Surveyor's records, the land was covered predominantly by hardwood forests and areas of prairie and marsh. The majority of the land that is now WPNP was farmed from the early 1900's to early 1990s. The undeveloped portions were 2 stands of hardwood trees and a series of kettle lakes and associated wetland areas. From 2000-2001 the land that is now WPNP was acquired by the City of Battle Creek through land acquisition with assistance from a Michigan Department of Natural Resources Trust Fund Grant and a donation by the Pontoni Family.

In 2005, the Neighborhood Planning Council (NPC) #10 established a committee to name the park. The name, Woodland Park and Nature Preserve was selected. Soon after that, citizens from the greater Battle Creek area organized and formed the Woodland Park Foundation Committee (WPFC). WPFC has developed by-laws, established 501(c)3 status under the umbrella of the Battle Creek Community Foundation and worked in conjunction with the City of Battle Creek Parks and Recreation Department to help manage the property as a nature preserve. For additional detail, an expanded timeline is included in the appendix.



WPNP Property 1939



WPNP Property 2000

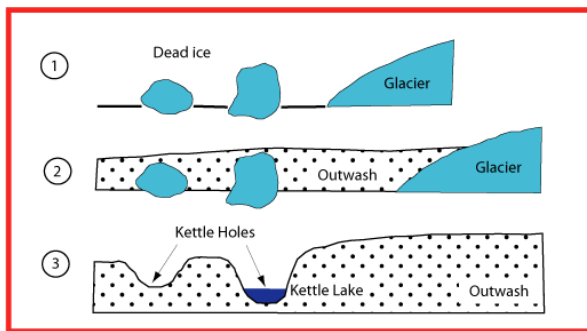
Geology and Soils

The predominant soil types are classified as 29B and 29C Hillside Sand Loam and 16B and 16D Oshtemo Sandy Loam. These soils exist on the uplands on slopes ranging from 0 to 12 percent and



are well drained. Muck soils and loamy soils are found in the lower and flatter areas. All these soils are characteristic of a glacial kettle moraine landscape.

The soils, landforms and the rolling and hilly topography were created by a retreating glacier. It is a “kettle moraine” landscape which contains a series of dry and wet (lake) kettles created by a combination of ice block remnants of the retreating glacier and covered or partially covered by glacier debris left by the glacier and by the glacial melt waters. There are ten wet and dry kettles in the site.



Formation of kettles by retreating glacier

Habitats

An existing conditions inventory was completed by the LAP during a site visit in July of 2011. This inventory was compared to the GPS Plant Inventory completed in 2007, historical surveyors notes from the Public Land Survey completed in the late 1800’s and the Michigan Natural Features Inventory, “Vegetation circa 1800s of Calhoun County Michigan” map for Section 21 of Battle Creek Township (T2SR8W). The inventory was compiled into the Existing Inventory Map included in this document. The following is a description of the existing habitats at the WPNP.

Wooded Areas

There were several wooded areas at the park; they are identified as areas B-F, H-K, M-S and Z on the Existing Inventory Map. They were classified into forest types based on the presence and predominance of particular species of trees, topography, soils, hydrology and level of disturbance. Animals that are likely to inhabit these areas are cavity nesters, species of detritus-based food webs, canopy-dwelling species and interior forest obligates.

Oak Maple Hickory Forest

Areas E-F and M consisted predominantly of Oak, Maple and Hickory trees, but also had Cherry, Walnut and Sassafras. Invasive plants were not as predominant which is most likely due to limited disturbance in these areas. Aerial photos of the area from the 1930 to 2000 show that these areas have remained woodland. There are many old growth trees with large caliper trunks. At the time



inventory was taken in June of 2011, a recent wind storm had knocked over several of the older trees. Wind throw is part of the natural process of regeneration in this type of forest and openings will allow for new growth.

Beech Maple Oak Forest

Areas C-D, N-O and S consist predominantly of Beech, Maple and Oak trees with Cherry, Hickory, Sassafras and Sumac present at a lower ratio. Aerial photos from 1930-2000 demonstrate that Areas C-D are the second area of old growth forest on the property. This area also experienced storm damage in June of 2011.

Wooded Wetland

Areas T-U consists of predominantly Maple and Swamp Oak in the wetter areas as well as Elm, Hickory and Aspen on the fringes. The fringes likely include low quality trees such as Elm and Aspen due to succession following clearing for farming. Water levels fluctuate with the seasons due to the low lying topography. Vernal pools provide critical areas for wildlife including reptiles and amphibians.

Walnut Grove

Area B is a more recently disturbed area. A small grove of Walnut trees have come in with trees of various ages and sizes. The monoculture is likely due to recent disturbance to the land and sensitivity of some plants to Walnut toxicity.

Natural Succession Area

Areas G and T-Y were farmed up until the early 1990s and exhibit the characteristics of an early successional forest. Trees have smaller caliper trunks and are often low quality trees such as Elm with the presence of shrubby undergrowth. The recent disturbance has also led to a high concentration of invasive plant species such as Multiflora Rose, Buckthorn and Russian Olive. Historic aerial photos dating back to 1930 show little disturbance around the kettle lakes and low lying wetland areas. This is most likely due to their hydrology and inability to be cultivated for field crops.

Open Space

There are a few open spaces in the park; they are identified as Areas A, R and L on the Existing Inventory Map. These areas are open due to cultivation for farming over the past one-hundred years. They were classified into open space types based on the presence and predominance of particular species of trees, predominance of open space, topography, soils and level of disturbance. Animals that are likely to inhabit these areas are insects such as butterflies, ants and grasshoppers; grassland birds; small mammals such as moles and mice; medium sized mammals and birds such as skunks, Fox and Turkey; reptiles and Deer.



Meadow/Prairie

Area A and portions of Area R and L are mostly open space with forbs such as Goldenrod and non-native grasses and occasional stands of various varieties of trees and shrubs. Invasive species such as Russian Olive, Multiflora Rose, Honeysuckle and Poison Ivy are prevalent.

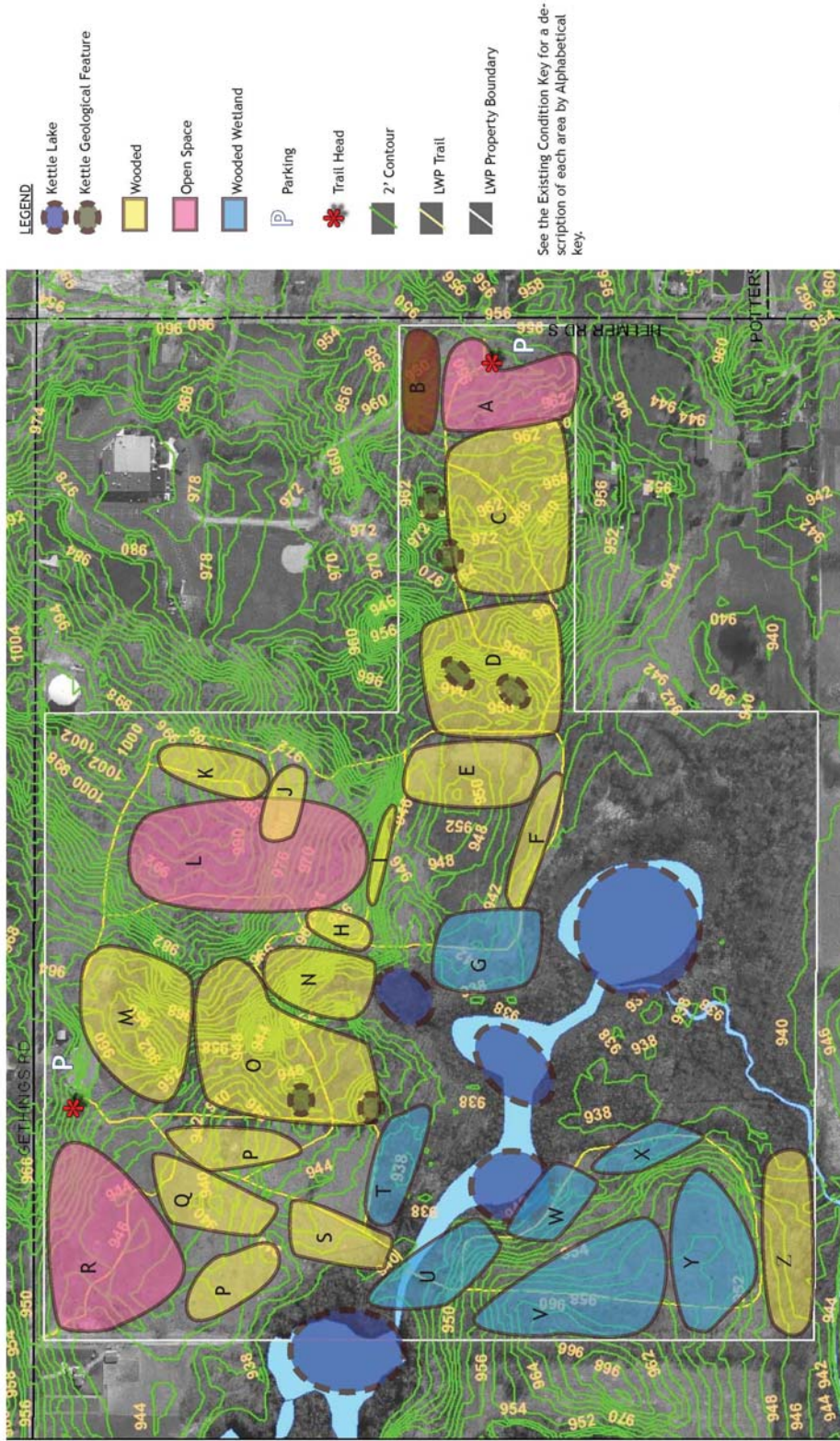
Oak Savanna

The southern portions of Area R and L contain a combination of open area and stands of trees. The rolling topography and glacial moraine soils of Area L is typical of an Oak Savanna. This type of habitat is usually bordered by ecosystems that are tolerant of fire such as open prairie/meadow habitats and mesic (dry) forests that contain a predominance of Oak species. Invasive species such as Russian Olive, Multiflora Rose, Honeysuckle and Poison Ivy are prevalent.



WOODLAND PARK AND NATURE PRESERVE - EXISTING CONDITIONS INVENTORY

OCTOBER 2011



See the Existing Condition Key for a description of each area by Alphabetical key.



Base information provided by City of Battle Creek, Public Works Department. Map produced by Landscape Architects & Planners, Inc.



LAKEVIEW WOODLAND PARK – EXISTING CONDITIONS INVENTORY

ID	Existing Condition Notes
A	Open -Goldenrod, Service Berry, Raspberry and Cherry. Few Multiflora Rose and Russian Olive. Sign vandalism.
B	Walnut Saplings. Mowing issue.
C	Maple, Oak, Beech, Cherry, Mayapple, Trillium. Some Multiflora Rose and Barberry.
D	Maple, Oak, Beech, Cherry, Sassafras. Some Multiflora Rose. Erosion issues. Large fallen Oaks.
E	White Oak, Red Oak, Sassafras. Open area - Goldenrod, Raspberry.
F	Box Elder
G	Maple, Swamp Oak and Willow. Wet. Lots of Buckthorn. Nice view of water.
H	Sumac
I	Some Honeysuckle
J	Blue Bird Houses, Lupine
K	Sassafras
L	Open - Lots of Poison Ivy and Russian Olive. Bee Balm, Golden Rod, and Blackberries. Few Oak, Walnut, Cherry, Sassafras and Sumac. Panoramic view.
M	Beech, Oak, Hickory, Sumac, Walnut, and Cherry. Locust and Buckthorn.
N	Swamp Oak, Walnut, Hickory, Sassafras and Sumac.
O	Walnut, Maple, Hickory, White and Red Oak and Cherry. Ferns and Mayapples. Some Multiflora Rose and lots of downed trees.
P	Aspen
Q	Dogwood, Ash, Poplar and Red Oak. Open area – Golden Rod. Lots of poison ivy particularly along trails.
R	Sumac, Cherry, White Oak, Walnut, Swamp Oak, Juniper, row of Hickory and cluster of Crab Apples. Russian Olive and Honeysuckle.
S	Hickory, Red Oak and Black Oak. Buckthorn.
T	Elm, Aspen, Oak, Sassafras and Iris. Wet. Buckthorn.
U	Maple, Swamp Oak, Hickory and Elm. Wet. Roses.
V	Maple, White Oak, Hickory, Elm, Chestnut and Aspen. Honeysuckle. Low quality trees.
W	White and Black Oak, Maple, Dogwood, Ground Strawberry, and Fern. Wet. Buckthorn.
X	Wet. Multiflora Roses.
Y	Silver Maple and some Oak and Cherry. Low quality trees. Lots of Multiflora Roses, Honeysuckle, Russian Olive and Buckthorn.
Z	Wooded area. Buckthorn.



Invasive Plants

What are invasive plants?

Invasive species are plants entering a new habitat from a different part of the country or from foreign countries. They are plants that flourish in their new environment because they have no or few natural enemies that control their growth. Plants spread by human use, by re-rooting and by the disbursement of seeds through bird and animal droppings.

Why is it important to control invasive plants?

While some invasive plants have special value in the environment, such as providing food and cover for certain wildlife, the real problem is that they can flourish and soon overwhelm and crowd out other plant species and thus become a dominant plant. The result is a less diverse plant community and consequently a less diverse, insect, bird and animal community.

What are the major invasive plants in the Park?

Nine invasive and one native plant of concern have been identified, two of which are varieties of the Barberry and Olive species. These include:

1. Japanese Barberry (*Berberis thunbergii*) and European Barberry (*Berberis vulgaris*) - The Japanese barberry was introduced from Japan around 1875, while the European barberry was brought to the US in the mid to late 1600's. Both were used as foods (jam) and dye making and are currently used as an ornamental. Their current habitat extends from the east coast to Montana.
2. Japanese Honeysuckle (*Lonicera japonica*) - This plant was introduced to the US in the 1800's as an ornamental shrub. It is an invasive plant throughout the Midwest and East Coast.
3. Russian Olive (*Elaeagnus angustifolia*) and Autumn Olive (*Elaeagnus umbellata*) - The Russian Olive is a Eurasian native that was introduced in the US in the 1800's as an ornamental tree. It was subsequently promoted by government agencies for use as windbreaks, wildlife habitats and erosion control. It exists throughout the US. The Autumn Olive is native to China and Japan and was brought to the US around 1830. It has been used for ornamental, erosion control and wildlife habitats. It exists from the Midwest to the East Coast.
4. Honeysuckle (*Lonicera Japonica*) - A native of Japan, this plant was introduced into the US in the 1800's as an ornamental. It is a very prolific plant that exists throughout the Midwest and East Coast.



5. Multiflora Rose (*Rosa Multiflora*) - This plant was introduced from Japan in 1886. The plant was used to control erosion, as a “living fence” to control live stock and as a snow barrier along roads. It has spread throughout the Northeast and Midwest.
6. Buckthorn (*Rhamnus cathartica*) - This is a Eurasian plant brought to the US as an ornamental hedge and subsequently used as a shelterbelt hedge and for wildlife habitat. It became naturalized in the 1900’s and currently exists throughout the Eastern and Midwestern states.
7. Garlic Mustard (*Alliaria petcolata*) - This plant is a European native that was introduced into the US in the 1800’s for food and medicinal uses. It has spread through most of the states from the East to the West Coast.
8. Poison Ivy (*Rhus radicans*) - This is the only native plant that needs to be controlled in the Park. It exists throughout the site in wooded as well as open grasslands.

Summary

Surveyors Records, Michigan Natural Features Inventory 1800s Vegetation Map, soil report, geological features, historic aerial photos and field observations all support the fact that the presettlement habitat for the WPNP was a combination of prairie, oak savanna, mesic forests and wetland areas. Farming the land for nearly 100 years has altered the majority of the native ecosystems except for two areas of old growth forest and the kettle lakes. The areas with the greatest disturbance coincide with the prevalence of invasive plant species. With proper management and diligence the native habitats can be restored over time.



Land Management Plan

Land Management Concept

The basic concept for the reestablishment of a vigorous, productive and attractive landscape recognizes five components listed in order of priority. These are:

- a. Removal of Invasive Plants
- b. Identification, Improvement and Reestablishment of Diverse Native Habitats
- c. Development of a Long Term Native Plant Planting Program
- d. Development of a Community Outdoor Information and Education Program
- e. Development of an On-Going Monitoring Program

Invasive Eradication

The initiation of an invasive species eradication program should be given top priority and will be a lifelong effort in the management of WPNP. Total elimination of the invasive plants is unlikely. Continual management efforts to remove invasive plants are necessary to keep these plants under control. This plan identifies a selective approach for controlling invasive by concentrating efforts in specific and manageable areas identified as priority habitats.

Control Methods (see *Invasive Plant Eradication: in Reference Manual*)

While a variety of control methods are proposed, the common denominator for all methods, except root removal and burning, is the application of herbicides. No feasible alternatives exist during the initial stages of eliminating the invasive plants.

Several control methods are recommended. Many of these methods can be applied throughout the year, particularly during spring, summer and fall seasons. Plant size, species and dormancy need to be considered. The following control methods should be considered.

Burning: If permitted, periodic burning is one of the most effective methods of controlling invasive plants in open grasslands.

Mowing: After grasslands are cleared of larger woody plants, periodic mowing is an effective method of controlling invasive plant, including poison ivy, growth in these open areas.

Root removal: This can be done by hand for smaller plants, including honeysuckle and barberry, particularly when the ground is moist. Larger plants can be pulled out of the grounds with tractor and chain. ALL roots must be removed.



Girdle: This method can be used for larger trees such as the Russian Olives. Cut a ring through the bark and cambium around the entire trunk and apply herbicide to the cut.

Cut stumps and apply herbicide: For smaller bush stems (less than 2 inches in diameter) use loppers and/or hand saws to create stump and apply herbicide within 15 minutes of cut.

Frill cut: Using a hatchet or axe, make several downward cuts into the bark and cambium and immediately apply herbicide. This method can be used on large plant trunks.

Dormant herbicide application: Spray plants when they are dormant. This is not effective on all plants. (Check Reference Manual). Also spray plants such as buckthorn, which retains its leaves very late, when other plants go dormant; or invasive plants that leaf out earlier than other plants.

Basil bark application: This can be used on select plants, by spraying the lower 18 inches of the plant with the recommended herbicide. (See Reference Manual)

Types of herbicides

While herbicides come in a variety of brand names, such as Roundup, there are two ingredients that need to be checked. If a brand name contains glyphosate it will kill all vegetation, including grasses. If a brand name contains triclopyr it can be used in meadows and will not kill the grass.

Materials and equipment

It is strongly urged that a secure storage structure be constructed on-site. This structure would be used to store herbicides and herbicide equipment, to mix herbicides, store materials and equipment for volunteers listed below, and as a clean up area.

Volunteer equipment for crews of ten would require ten pairs of gloves, 6 loppers, 3 hatchets, 3 handsaws and a 4-gallon backpack hand pump sprayer.

Brush Removal

Several options exist for the removal of cut and dead invasive plants. One option is to gather it in piles at edges of habitats for use as wildlife shelters. Option two is to pile it in open areas and burn the material the following year.








Invasive Plant Eradication Guide

The Invasive Plant Eradication Guide provides an outline of methods and procedures for eradicating the seven primary invasive plants in Woodland Park. Supporting information regarding eradication methods, the types of herbicide and application procedures as well as timing of the applications is documented in the various articles in Section II of the Reference Manual. It is important to emphasize that while initial eradication efforts can result in a major reduction of the specific



invasive plant, these plants will continue to be a threat. The eradication of these plants will be a continuous and long term effort.



Plant Name	Eradication Method(s)	Treatment Season	Herbicide Options	Comments	Photo
Multiflora Rose <i>Rosa multiflora</i>	<u>Mechanical:</u> Mowing 2 to 3 times a year for 2 to 4 years. Cut and leave stumps. Apply herbicide on fresh cuts. <u>Herbicides:</u> Foliar applications Dormant applications	Sp., su. & fall Apr. to Sep. Jan. thru Mar.	Banvel, Sterling, or Oracle Garlon 3A or 4, Banvel, Sterling, Oracle, Roundup, Glyphomax, Cimarron, Crossbow, Super Brush Killer, Brushmaster Banvel, Oracle, Crossbow, Super Brush Killer, Brushmaster, Roundup	Must remove all roots when herbicide is not applied. Must remove all roots.	
Japanese/European Barbary <i>Berberis thunbergii</i> <i>Berberis vulgaris</i>	<u>Mechanical:</u> Dig & pull by hand or tractor & chain or mow to the ground at least once per growing season. Cut and spray stumps. <u>Herbicides:</u> Foliar applications Stump applications	Sp. Late su. as fruit matures Sp.	 Garlon 3A or 4, Roundup, Banvel, Touchdown, Brushmaster, Roundup, Touchdown, Crossbow	Remove when ground is wet. Remove all roots. Spray within 10 minutes of cutting.	
Honeysuckle <i>Lonicera japonica</i>	<u>Mechanical:</u> Hand pull small plants. Use tractor for larger plants. <u>Mechanical & Herbicide:</u> Cut & spray. <u>Herbicide:</u> Foliar applications	Early sp. Sp., su. & fall Sp. & fall	Roundup, GlyproA, Gar on 3AA, Garlon 4A Roundup, GlyproA, Gar on 3AA, Garlon 4A	Remove when ground is wet. Remove all roots. Spray within 10 minutes of cutting.	
Russian/Autumn Olive <i>Eleagnus angustifolia</i> <i>Eleagnus umbellata</i>	<u>Mechanical & Herbicide:</u> Basal bark spray Foil cut - Involves downward hatchet cut which is soaked with herbicide. Cut and spray.	Sp. & su. Sp. & su. Sp. & su.	Roundup, Brushmaster Roundup Roundup	Completely saturate trunks. Spray stumps within 10 minutes of cutting.	
Buckthorn <i>Rhamnus cathartica</i>	<u>Mechanical:</u> Pull up small shrubs (1" or less in dia.) <u>Herbicide:</u> Cut and spray. Basal bark spray. Foliar applications (small shrubs)	Sp. Sp., su. & fall Sp. & fall Sp. & fall	 Garlon 4, Roundup Brushmaster Roundup, Brushmaster	Remove all roots when mechanical method is used. For foliar app. spray before other plants leaf and after other plant go dormant.	
Poison Ivy <i>Rhus radicans</i>	<u>Herbicide:</u>	Sp.	Brush-Be-Gone Poison Ivy Killer, Garlon 3A or 4	During rapid growth and before flowering.	
Garlic Mustard <i>Alliaria petiolata</i>	<u>Hand Pull:</u> Pull when soil is wet. <u>Herbicide</u>	Sp., su., & fall Sp., su., & fall	Garlon 3A or 4	Remove all root. Bag & deposit plants in landfill. Roundup when other plants are dormant	



NOTES:

- ✓ See Referenced Articles Manual for more detailed description of eradication methods.
- ✓ Listed herbicides may not be available in all areas. Check out related herbicides and the appropriate applications and application rates.
- ✓ Glyphosate and Triclopyr are two base chemicals used in the various brand name herbicides. Herbicides containing Triclopyr are selective and can be applied in grass areas, whereas herbicides containing Glyphosate are non-selective.
- ✓ A mixture of the herbicide with kerosene or diesel fuel is suggested for many but not all applications.
- ✓ It is recommended that a dye such as “Bark-Oil-Blue” be added to the herbicide to clearly mark areas covered by the spray.
- ✓ Only individuals with chemical certifications should be allowed to apply the herbicides.
- ✓ Regardless of the type of invasive species or the type of removal, it will often take several years of observation and repetitive applications to remove the species, due in part to the survival rate of the seeds, the extensiveness of the root systems and the dissemination of seeds by wind and animals.



Restoration

Prairie Restoration (see Reference Manual Section IV: Prairie Restoration)

The Woodland Park Foundation Committee is faced with several options in the development and maintenance of the grasslands. Does the Organization wish to create a true native prairie with only native grasses and forbs? Or does the Committee wish to maintain open meadows? A third option would be to develop a small “demonstration” prairie of between two and five acres in size and maintain approximately 10 to 15 acres of meadow.

Each option has consequences related to costs, volunteer time requirements, education and quality of habitats. It is noted, however, that once the prairie and meadows are established volunteer time and effort will be significantly reduced. All discussion about prairies and meadows assume that burning, which is the most effective and productive way of creating and maintaining prairies and meadows, is not an option in the near future.

Development of a Mesic Native Plant Prairie Demonstration Area

The development of a native plant prairie will be a 5-year project. It will require a series of steps as outlined below. These steps are recommended to eliminate all cool weather grasses and non-native forbs. Immediate consideration should be given to seeking grants to undertake the project. Following are the recommended steps for the preparation of a native plant prairie.

1. Site Preparation
 - a. Remove all woody plants from proposed prairie area.
 - b. Mow area and remove mowed material from area.
 - c. Apply Roundup to the entire area in the spring when weeds are about 10 inches high.
 - d. If weeds return, apply Roundup a second time when they are about 10 inches high.
 - e. Disc the site in the fall for fall planting.
2. Planting
 - a. Broadcast a mix of grass and forb seeds in late September and plant a nurse crop of wheat or oats at 100 pounds per acre or annual rye at 40 pounds per acre over broadcasted seeds. Use a drill seeder. DO NOT FERTILIZE.
 - b. Use roller or culti-packer to press seeds into the soil.
3. Seed Mix
 - a. One of the characteristics of native plant prairies is the great diversity of grasses and forbs. Some of the most productive prairies have as many as 200 species. (A typical lawn may contain four or five species) It is recommended, however, to start out with a low grass and forb seed mix of about 30 to 40 species.



- b. Contact a local supplier of native plant seeds to discuss mixes, site preparation and application rates and methods. (See Reference Manual Section VI: Plant Material Sources).
4. Maintenance Program - During the first two years the forbs and grasses concentrate their energy in building up the root system. Consequently the area will look messy with bare spots and dominated by annual weeds.
 - a. Year One
 1. Mow when weeds get about six inches high and before they go to seed.
 2. Mow with a mulching or flail mower about six inches high. Will require mowing two to three times until late September.
 - b. Year Two
 1. Mow six to eight inches as soon as weeds begin to grow. Limit mowing to two times.
 2. Pull sweet clover before it goes to seed.
 3. Spot applications of Roundup to weeds and non-native grasses.
 - c. Year Three
 1. If possible burn the area. To keep flames low, mow the tall grasses.
 2. If mowing only, use mulching mower and remove thick clumps of clippings. If clippings cannot be remove set mower eight inches high.
 3. Inter-seed areas with poor growth.
 - d. Year Four and Beyond
 1. Continue burn or mowing on a two-year cycle. Remove clippings after mowing. If clippings cannot be removed, set mower eight inches high.
 2. Inter-seed or plant seedlings to maintain or increase diversity.
 3. Continue to monitor area and undertake spot applications of herbicides as needed.
 4. Organize a community picnic in the prairie.
5. Maintenance of Meadows - The bulk of the open areas should be maintained as meadows. Whereas the Mesic Native Plant Prairie should not contain any cool weather (non-native grass), the meadow will be maintained to contain both cool and warm (prairie) grasses and forbs.
 - a. Remove all invasive plants.
 - b. Mow grass ten inches high every two to three years.
 - c. Inter-seed with prairie grasses and forbs. Planting may also include forb root stock.
 - d. Continue monitoring areas for invasive plants.



Forest Habitats

Two major forest habitats exist in Woodland Park and Nature Preserve. These include the Beech-Maple forest located in Priority Zone 2 in the southeastern part of the park and the Oak-Hickory located in Priority Zones 4 and 6. In addition a new habitat, an Oak Savanna, is proposed in the southern portion of Priority Zone 1 as an extension of the proposed mesic prairie. A fourth habitat is recognized in the southern most portion of the park, across the wetland. It is an “old fields” successional forest. Following are suggested long-term land management recommendations for each of these areas. The primary objectives are to enhance species diversity and encourage regeneration of native species.

Beech-Maple Habitat

1. Remove all invasive plants.
 - a. Plant only native trees, shrubs and forbs (see partial list below).
 - b. Sources include the local Soil Conservation agency and native plant nurseries.
 - c. Plant specific species in areas where they are not present or predominant.
 - d. Protect all plantings with a 4 foot high and 12 inch diameter wire mesh (chicken wire).

2. Partial plant list (listed according to predominance).

Trees and Shrubs:

Sugar Maple – <i>Acer saccharum</i>	Black Cherry – <i>Prunus serotina</i>
American Beech – <i>Fagus grandiflora</i>	Bitternut Hickory – <i>Carya cordiformis</i>
Black Maple – <i>Acer nigrum</i>	Red Maple – <i>Acer rubrum</i>
Common Hackberry – <i>Celtis occidentalis</i>	American Hornbeam – <i>Ostrya virginiana</i>

Understory Trees and Shrubs

Spicebush – <i>Lindera benzoin</i>	Mapleleaf Viburnum – <i>Viburnum acerifolium</i>
Flowering Dogwood – <i>Cornus florida</i>)	

Forbs

Smooth Yellow Violet – <i>Viola eriocarpa</i>	Running Strawberry Bush – <i>Euonymus obovatus</i>
Sweet Cicely – <i>Osmorhiza claytona</i>	Black Snake Root – <i>Sanicula canadensis</i>
Shiny Bedstraw – <i>Galium concinnum</i>	Jack in the Pulpit – <i>Arisaema triphyllum</i>
Wild Ginger – <i>Asarum Canadensis</i>	Jewel Weed – <i>Impatiens pallida</i>



Oak-Hickory

1. See 1) through 5) above.
2. Partial list of plants (listed according to predominance)

Trees:

White Oak – <i>Quercus alba</i>	Tulip Poplar – <i>Liriodendron tulipifera</i>
Red Oak – <i>Quercus rubra</i>	Eastern Redbud – <i>Cercis canadensis (u)</i>
Black Oak – <i>Quercus velutina</i>	American Hornbeam – <i>Ostrya virginiana (u)</i>
Pignut Hickory – <i>Carya glabra</i>	Flowering Dogwood – <i>Cornus florida (u)</i>
Shagbark Hickory – <i>Carya ovata</i>	

(u) = understory

Forbs

Rue-anemone – <i>Thalictrum thalictroides</i>	Cut-leaf Toothwort – <i>Cardamine concatenate</i>
Star Chickweed – <i>Stellaria pubera</i>	Woodland Agrimony – <i>Agrimonia rostellata</i>
Spring Beauty – <i>Claytonia virginica</i>	Bedstraw – <i>Galium latifolium</i>
Goldenrod – <i>Solidago caesia</i>	Feverwort – <i>Triosteum angustifolium</i>
Three-lobed Violet – <i>Viola palmate</i>	

Oak Savanna (see Reference Manual – Section V: Forests –Articles 2)

The oak savanna is associated with prairies. They exist because of the resistance of oaks to prairie fires. Typical oak savannas are open wooded areas with 15 to 25 trees per acre. Tree canopy should range from a minimum of 10 percent to no more than 50 percent coverage of the area. Ground cover is the type of prairie grasses and forbs found in the proposed mesic native prairie.

1. Remove all non-oak savanna trees, shrubs and invasive plants.
2. Mow area to 10 inches high. If at all possible burn the area in the fall.
3. If burning is allowed, roundup or mow three foot radius around each oak tree.
4. Plant trees at least 30 feet apart and in clusters.
5. Limit types of oaks to three species.
6. Select tree stock of at least three feet tall. Select container grown air root pruned seedlings with fibrous roots rather than taproots.
7. Partial plant list (list according to predominance)

Trees and Shrubs:

Bur Oak – <i>Quercus macrocarpa</i>	Black Oak – <i>Quercus velutina</i>
White Oak – <i>Quercus alba</i>	Swamp Oak – <i>Quercus bicolor</i>

Grasses and Forbs

Select the plants listed for mesic prairies in the Reference Manual – Section VI: Plant Material Resources – Articles 2.



Successional Woodlands

The primary successional woodland is located in Priority Zone 8, in the southern most part of the park.

1. Use area as a study area to illustrate the natural succession of farmland to forest.
2. Set up observation and photographic stations to study the changing landscape over time.
3. Remove invasive plants.

Flowering Woodland Edge (Native Plants of Home Garden Interests)

The plants listed below are small native trees and shrubs of interest because of their flowers and because they provide food for birds. The plants exist in the natural environment at the edges and within forest areas that provide some speckled sunlight. All of these trees and shrubs can and should be used in home landscaping projects.

1. Use these plants to demonstrate their native habitats.
2. Place these plants in areas illustrated in the Priority Plan Zones 1, 2, 3 and 6.
3. Partial plant list

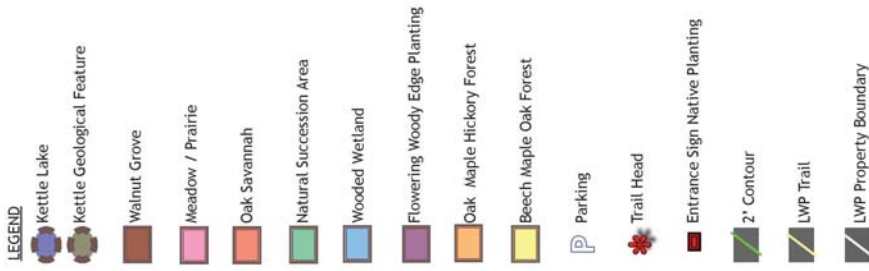
Downey Serviceberry – <i>Amelanchier arborea</i>	Eastern Redbud – <i>Cercis Canadensis</i>
Apple Serviceberry – <i>Amelanchier grandiflora</i>	Spicebush – <i>Lindera benzoin</i>
Dogwood – <i>Cornus florida</i>	Amer. Cranberrybush – <i>Viburnum Trilobum</i>
Hawthorne – <i>Crataegus species</i>	

Woodland Park Land Management Plan



WOODLAND PARK AND NATURE PRESERVE- ECOSYSTEM AREA PLAN

OCTOBER 2011



Base information provided by City of Battle Creek, Public Works Department. Map produced by Landscape Architects & Planners, Inc.



Volunteer Program

The Woodland Park Foundation Committee is the organizing force behind the development and implementation of the Land Management Plan. The Committee's objective is to implement the Plan recommendations. To succeed in this endeavor it depends on the organization and supervision of a cadre of volunteers from the community. To achieve this objective, it is suggested that a total of six subcommittees be formed, with each subcommittee including additional volunteers and each headed by at least one Woodland Park Foundation Committee Member.

Volunteer Subcommittees

1. Invasive Plants: This subcommittee's mission would be to eradicate invasive plants from the Park. Its responsibilities include developing an understanding of eradication techniques, the safe handling and application of various herbicides and the organization of eradication work crews. At least one member, preferably more, should be certified to handle herbicides.
2. Planting: The mission of this subcommittee is to expand the diversity of the forest habitats by planting only native trees, shrubs and forbs. Its responsibilities include the identification and cost of plant and seed sources, working with the Fund Development Subcommittee in seeking funding sources and organizing work crews, preferably youth groups, in the planting of trees, shrubs and forbs as prescribed in the Plan. The subcommittee may also engage work groups in collecting specific native seeds and nuts from the area.
3. Education: The mission of this subcommittee is to inform the greater Battle Creek Community about the importance and role of native plants and diverse habitats in the environment. Its responsibilities should include preparation of interpretive signs and literature about the history, geology and habitats in the Park and about the plans for creating more diverse native plant habitats. It may include the development of classroom displays and materials as well as general community programs about the natural environment.

In discussions with the Woodland Park Foundation Committee, the Battle Creek Math and Science Center has indicated a willingness to investigate ways to encourage teachers to utilize Woodland Park and Nature Preserve as an outdoor classroom to help students achieve specific science objectives. In the past, the public school districts in Battle Creek have also supported the outdoor classroom model for Woodland Park.

4. Public Relations/Fund Development: This subcommittee has two missions: to promote the Park's concept of creating diverse native plant habitats and park activities and to raise money for general operations and special projects. Its responsibilities include preparation of media information (newspaper, television, radio, website, Facebook, Twitter, etc.), promotion of Park activities and special events, preparation of grants, and organization of fund raising activities.



5. Programs and Events: This subcommittee's mission is raise community awareness of the Park environment. These may include volunteer day activities and picnics, Arbor Day tree planting, programs related to the Parks' geology, special habitats, land management activities, spring wildflowers, etc. It can also include "fun" development activities such as a picnic in the mesic prairie, dining on the native plants, nuts and berries, and special trail walks.
6. Special Projects: This subcommittee's mission is to organize and help implement special projects. The subcommittee's responsibilities include, identification of specific projects, coordinating efforts with the Public Relations and Fund Development subcommittee in grant writing, contacting local contractors and coordinating the implementation of the projects such as the Mesic Prairie and Oak Savanna projects.

Volunteer Production

An estimate of the productive capacity of volunteers is difficult to determine because it is based upon so many variables. For purposes of this report, the estimates will be based upon two major areas of activities: the planting of trees and shrubs and the eradication of invasive plants. The variables are the age, maturity, and character of the volunteers and the leadership abilities of the supervisor. In the case of eradication of invasive plants, the additional variables include size, density and type of plants. In the case of planting trees and shrubs, the additional variables include size of trees and shrubs and planting location.

1. Eradication of Invasive Plants - The proposed 4-acre Mesic Prairie area in Priority Zone 1 contains a moderate amount of invasive shrubs. Using this area as an example, a 5-person crew, including a supervisor, working a four hour period should be able to clear about 1.5 acres of plants in the 4-hour period. Thus the entire site would take approximately 11 hours. (4 acres/1.5 acres x 4 hours) Priority Zone 3 contains larger, denser and greater variety of invasive plants. It should be expected that a same size crew could only clear about 3/4th of an acre in a 4-hour period.
2. Planting of Trees and Shrubs - Using a crew of five volunteers, including a supervisor, it is estimated that the crew could plant five to seven trees in a 4-hour period. The trees would be no larger than 1-1/2 inch diameter (approximately 10 to 12 feet tall). The crews would stake 4-foot high chicken wire with 2 6-foot wooden stakes and deep water each plant. Obviously the production would increase if smaller trees and shrubs were planted.



Educational Program

The primary objective of an education program is to disseminate information about the natural environment, in general and about the Woodland Park and Nature Preserve environment, in particular. The audience would be the residents of Battle Creek, in general, and classrooms and youth organizations in particular.

Program Theme

Because of the varied landscape, wetlands, uplands, kettle moraine features, old fields, successional wooded areas, and a mix of mature forest, the program has an opportunity to use “the changing landscape” as its theme, with an emphasis on how humans changed the original environment and are now reversing the process back to a “native environment”.

Presentation Methods

1. Power Point Presentations - These presentations could show the great environmental diversity that exists in the Park and also the efforts undertaken by the Committee to enhance that diversity. Several different Power Points should be designed for presentations to school groups, service organizations, corporate sponsors and special interests groups.
2. Interpretive Information - A variety of interpretive formats should be considered. Interpretive signs, ranging in size from 30” x 40” illustrating complex habitats, such as a prairie area or a beech-maple forest, to 12” x 18” inch signs illustrating a single feature such as the characteristics of a hickory tree could be displayed throughout the park. Numbered or lettered sign posts could be located at key interpretive spots, throughout the Park that would be accompanied by an interpretive pamphlet with numbers or letters corresponding to the posts. The interior and exterior of the silo may be remodeled as an interpretive center containing a variety of interpretive panels. More sophisticated interpretive formats may include electronic chips embedded in a post that can be scanned for its contents.
3. Interpretive Topic Ideas

a. 30” x 40” Panels

What is a Prairie?

Woodland flowers

Animal homes

Animals in the park

Various forest habitats

Prairie flowers

Forest succession

Geology

Pond life

Birds in the park

Edible plant foods

Hydrology cycle



b. 12"x`8" Panels

Bird eggs

Butterflies

Animal food

Tree rings

Animal tracks

Fruits in the park

Moss & lichens

Life in a rotting log



Action Plan

A Priority Plan was created for the development of the WPNP Ecosystem Area Plan. Priorities were established based on several factors including, but not limited to; the existing WPNP Site Master Plan, project impact, visibility, unique and significant features and ecosystems, availability of volunteers and assistance from the City of Battle Creek, including mowing, prevalence of invasive plants and feasibility. The Priority Plan is a long range plan while the Action Plan addresses a 5-year period.

The 5-year plan calls for three types of concurrent activities to occur in Priority Zones 1 and 2. These include invasive species eradication, planting trees and shrubs and the construction of a Mesic Native Prairie. It should be noted that the mowing, eradication and tree planting programs will continue beyond the 5-year plan. This plan represents a guide for managing the land in WPNP. Adjustments in the production estimates are likely based upon several years of field experience

Grants (see Reference Manual: Section I)

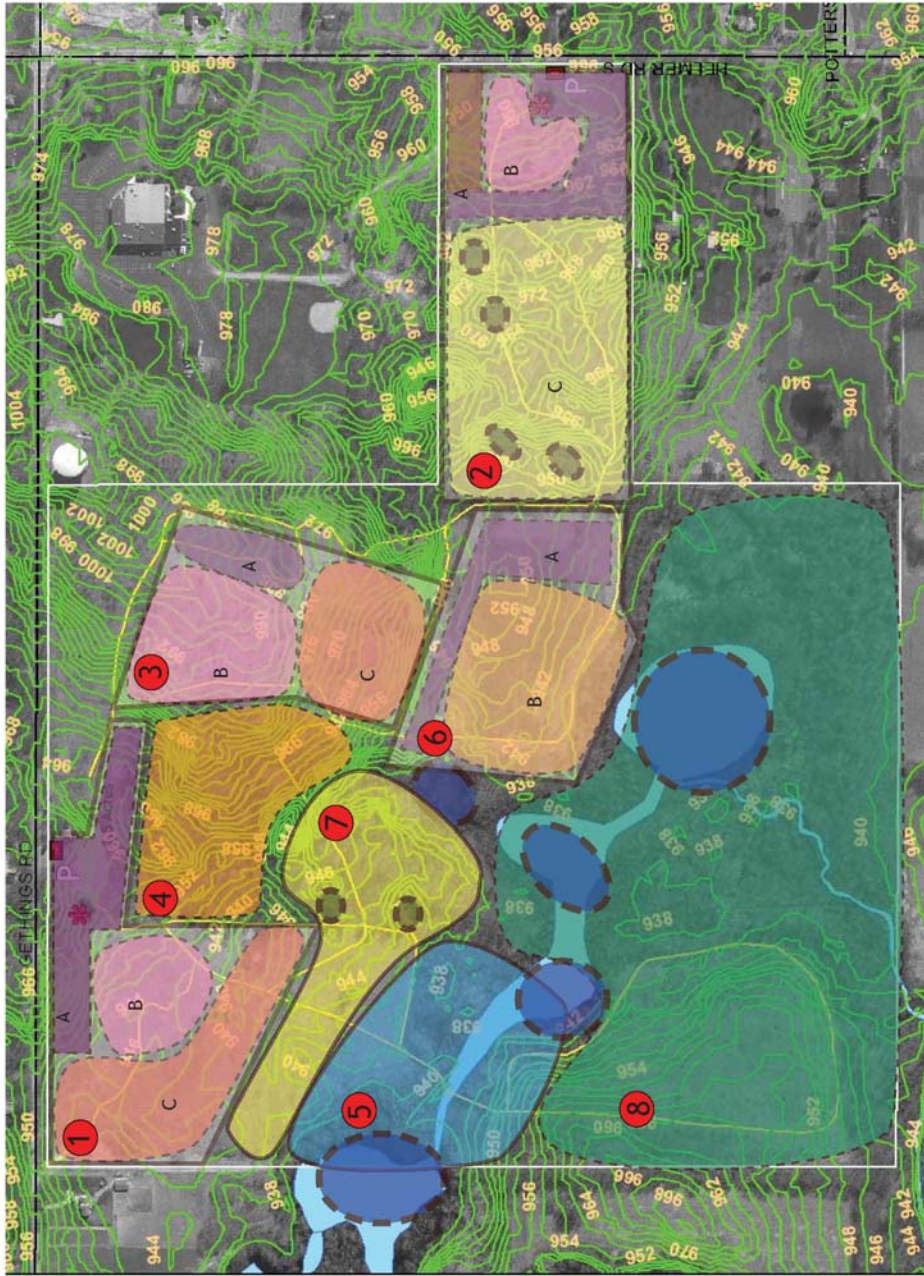
This section of the Reference Manual includes a list of potential grant source for the types of projects proposed in the Park. In some situations, such as with any grants from state agencies, applications should be coordinated with the City of Battle Creek.



WOODLAND PARK AND NATURE PRESERVE - PRIORITY PLAN

October 2011

- LEGEND**
- 1** Priority Zone
 - A Priority Zone Subarea
 - Kettle Lake
 - Kettle Geological Feature
 - Walnut Grove
 - Meadow / Prairie
 - Oak Savannah
 - Natural Succession Area
 - Wooded Wetland
 - Flowering Woody Edge Planting
 - Oak Maple Hickory Forest
 - Beech Maple Oak Forest
 - Parking
 - Trail Head
 - Entrance Sign Native Planting
 - 2' Contour
 - LWP Trail
 - LWP Property Boundary



Base information provided by City of Battle Creek, Public Works Department. Map produced by Landscape Architects & Planners, Inc.



PROJECT SCHEDULE

Projects	Volunteer Production Hours & Project Activities														
	2012			2013			2014			2015			2016		
	sp	su	fa	sp	su	fa	sp	su	fa	sp	su	fa	sp	su	fa
Invasive Plant Removal															
Zone 1	8	8	8										8		
Zone 2			8										8		
Zone 3			10	20	10	10								8	
Zone 4						16	10							8	
Zones 5 thru 7							20	10	20	10	10	20			16
Woody Planting Prog.															
GrantPrep.Plant purch.	xx	xx				xx			xx			xx			
Zone1 Flowering Natives				10		10									
Zone 1 Oak Savanna						12	12								
Zone2 Flowering Natives				10											
Zone3 Flowering Natives							12		8						
Zone 2 & 4 Forest Infill										12		12	12		12
Mowing Program															
Mesic Prairie 4 acres	xx								xx				xx		
Oak Savanna 5 acres	xx		xx			xx				xx					xx
Zone I B			xx				xx					xx			
Zone 3 8 acres						xx				xx					xx
Mesic Prairie															
Grant Prep.	xx					xx									
Roundup Prairie Area				xx	xx										
Disk Prairie Area						xx									
Plant Prairie Plants						xx									
Mow Prairie Area										xx		xx			xx
Weed Removal							xx	xx		xx			xx		
Overseed in barren areas												xx			xx
Interpretive/Educ. Prog															
Grant Prep.				xx					xx						
Design Displays					xx	xx	xx								
Seasonal Hours	8	8	26	40	10	48	54	10	28	22	10	32	28	16	28
Annual Hours	44			98			92			64			72		



Appendix

Woodland Park Land Management Plan



Late 1800s	T2SR8W, Section 21 Surveyed for the Public Land Survey
1900 - 1930	Portions of the land were cleared and farmed
1940	Brunt Family farms the land that became Woodland Park and Nature Preserve
1947	Richard and Sarah Wassenaar(Brunt) purchased a portion of the farm from Frank Brunt (Sarah's Father)
1950-1970	Land farmed by the Wassenaar family and others
1977	Raymond Pontoni and Kralis bought the Wassenaar Farm
1980-1990	Portions of the original property were bought and sold. Land developed or farmed
October 3, 2000	Resolution authorized City Manager to execute MDNR project agreement and Grant Land Acquisition to purchase 126 acres off Gethings Road, known as Southside and/or Pontoni Park
July 17, 2001	Resolution authorizing the City Manager to enter into Sales Agreement and Option to Purchase Property, 126 acres off Gethings Road, with Pontoni Land Holdings Family Limited Partnership. A conceptual Site Master Plan was included with resolution.
July 20, 2001	Gift of Real Property Agreement. Pontoni gift of 18 acres on Helmer Road
2002	Southside Park land acquired by the City of Battle Creek with assistance of MDNR grant funds and 18 Acre land donation from the Pontoni family
September 2005	Westlake/Prairieview Neighborhood Planning Council (NPC #10) voted to establish a committee to select a name for the 145 acre proposed park to be approved by its membership. This committee would meet on a regular basis with the Parks and Recreation Department.
October 24, 2005	NPC #10 passed a resolution to change the property known at Pontoni and/or Southwest Park to Woodland Park and Nature Preserve
November 15, 2005	Woodland Park and Nature Preserve name was approved by the Battle Creek City Commission
2005	Official e-mail address created, woodlandpark@comcast.net
January 2006	Citizens from the greater Battle Creek area met to discuss forming a committee to develop the Park. The Woodland Park Foundation Committee (WPFC) was established.
March 25, 2006	First of four public workshops sessions on what type of park to develop, surveys mailed and available on-line. Results supported keeping the park a natural area.
March 31, 2006	WPFC Community Project and Endowment Fund established with the Battle Creek Community Foundation, under the umbrella of BCCF 501(C)3 status.
May 2006	WPFC Advisory Committee Bylaws were established and approved by the Battle Creek Community Foundation.
May 17, 2006	Letter to City Manager from WPFC on in support for Site Master Park Plan
June 20, 2006	Resolution by City Commission to approve a Site Master Plan for the Woodland Park and Nature Preserve (WPNP)
2007	WPFC organized a project to identify and GPS the trees and shrubs of WPNP
2008	A representative from the City of Battle Creek Parks and Recreation Department is a member of the WPFC. WPFC Board of Directors hold regular meetings with the City of Battle Creek Parks and Recreation Department to ensure continued partnership and collaboration
May 2010	WPNP Foundation Committee website developed, www.woodlandparkbc.com
2011	WPFC received the Keep Michigan Beautiful President's Plaque and Certificate of Appreciation from Battle Creek City Commission
2011	The WPFC received a Capacity Building Grant from the Battle Creek Nonprofit Alliance for the development of a Land Management Plan
2011	Adopted the Woodland Park and Nature Preserve Land Management Plan