Depot Park a Showcase for Ecological Design

1940

2008

Master Plan

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University of Michigan

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Client: Clarkston Watershed Group

Project Location: Clarkston, Michigan

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Design (cont.)

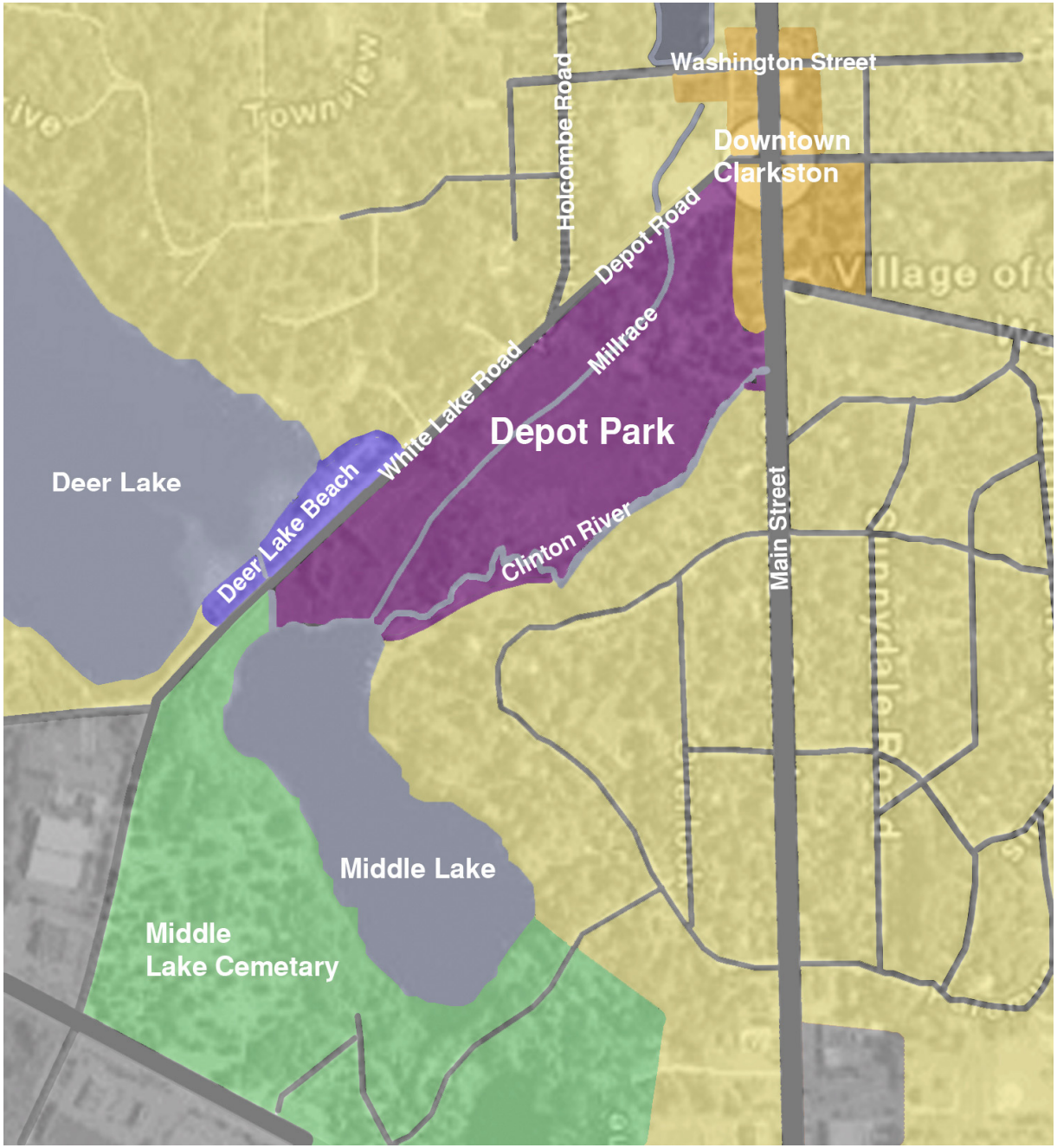
Introduction

Depot Park is the central gathering space for the City of the Village of Clarkston. Clarkston is a small village located 45 minutes north of Detroit in Southeastern Michigan. The village is approximately one-half mile square, and its small size reflects the community's desire to uphold the historic village boundaries. Clarkston has a popular influence on surrounding communities, and many neighboring citizens in Independence Township consider themselves from the village, though they live beyond Clarkston's official boundaries.

Depot Park is located in the heart of Clarkston's historic downtown. The park serves many civic functions throughout the year, including Art in the Park, farmers markets, summer concerts, and car club events. The park has a prime location to educate and inspire the public, and its current popularity engages visitors from Clarkston and surrounding communities. The Clarkston Watershed Group (CWG) is a group of committed citizens that are focused on improving Depot Park and protecting the natural resources of the greater Clarkston area.

With its central location and frequent use, Depot Park can become a living tool to illustrate principles of ecological and sustainable design. The park is currently operating without a master plan, which complicates routine decisions such as placement of memorials. The University of Michigan team is providing the Clarkston Watershed Group with a cohesive master plan that will ensure the future success of Depot Park as an inspiring and effective civic space.

This University of Michigan Masters Practicum Team specializes in providing designs that are both ecologically sensitive and aesthetically engaging. Our educational background in ecological design complements the environmental enthusiasm of the Clarkston Watershed Group. With the implementation of our master plan and supporting documents, the CWG can continue to foster education and environmental change in and around Depot Park.



Depot Park and it's surrounding context.

Background

Historical Context

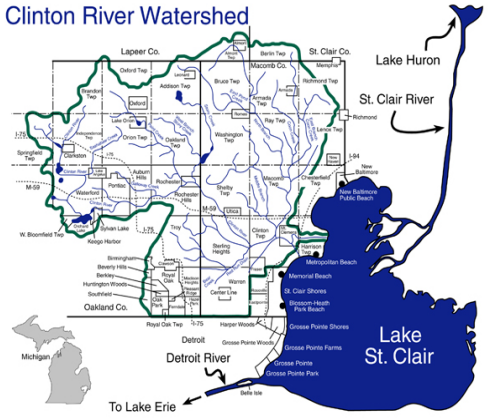
Prior to the installation of the park, the property was a wetland in the floodplain of the Clinton River. The millrace that runs through the site predates the founding of Clarkston. The millrace in its first iteration was built in 1832 to service the first sawmill in the area. In 1838, construction began on the dam along Washington Street, which created the millpond and increased the efficiency of the mill operations in town. In 1941, Henry Ford began a village industries project in Clarkston. The goal of these village industry projects was to create small factories in rural areas that could be used to create sub assemblies for the Ford Motor Company.

By placing the factories in rural towns, Henry Ford could take advantage of underused mills and their dams. Ford updated many mill buildings into new factories and converted dams to hydropower in order to power the new factories. The project in Clarkston lasted only a short time; the village dam was updated but the village industry projects were shortly discontinued in 1947 upon the death of Henry Ford, as they were viewed merely as his personal hobby.

Mill Building Constructed 1839 This view could be seen from Main Street (Radcliff 1976)

Southern end of Mill Pond c.1890 Washington Street in background (Radcliff 1976)

In addition to the millrace in Depot Park, the other main water feature in the area is the Clinton River. The Clinton River originates several miles north in Independence Oaks County Park and winds circuitously through Southeast Michigan into Lake St. Clair. Historically the Potawatomi, who were members of the Ojibwe, used the Clinton River heavily for passage, like many rivers in Michigan. Chief Sashabaw was a local leader. A tributary of the Clinton River, North of Clarkston was named after Sashabaw, as it was a location he favored for hunting. The area also has named schools, roads and subdivisions in his honor.



Map of Clinton River Watershed Depot park is located at the far Western edge of the watershed.

Effects of Development

The village of Clarkston was established in 1842, but the downstream areas closer to Detroit were settled earlier (Rochester 1817, Utica 1829, Mount Clemens 1818). The pattern of expanding settlement has continued to this day putting great pressure on the health of the river ecosystem. As settlers moved in, more land was cleared of its native vegetation and converted to agricultural uses.

While agriculture was necessary for the survival of the towns, the vast farming land that has spread across Southeastern Michigan has changed the way that water moves through the local hydrologic system. Runoff from agriculture fields has increased the concentrations of sediment and nutrients in local rivers and wetlands. Until recently, many of these negative impacts were buffered by the natural filtering provided by intact healthy wetlands (Mitsch, 2000). This natural balance began to change as wetlands were filled and developed for other uses.

The combined effects of converting natural areas such as woodlands and wetlands to agriculture or subdivisions has completely changed the way that water moves through the watershed. Currently, the Clinton River flows through watershed areas that are progressively more developed, with increasing rates of urban runoff. Urban runoff, or stormwater, is the product of the high percentage of impervious surfaces that are associated with cities, towns, streets, sidewalks, driveways and roofs (Strom, 2004).

Before development, rain typically fell on a naturally vegetated ecosystem that buffered the impact of a storm event. The vegetation's leaves intercepted a portion of the falling rain before it could reach the ground. A complex root matrix formed by the understory vegetation would hold a thick mulch of leaves and twigs intact. The soil in intact ecosystems often has a greater ability to infiltrate rainwater (Quote). Most of the rainwater falling on this ecosystem would eventually enter the groundwater in this manner, and the small portion that did not infiltrate would run over land eventually reaching local streams and rivers.

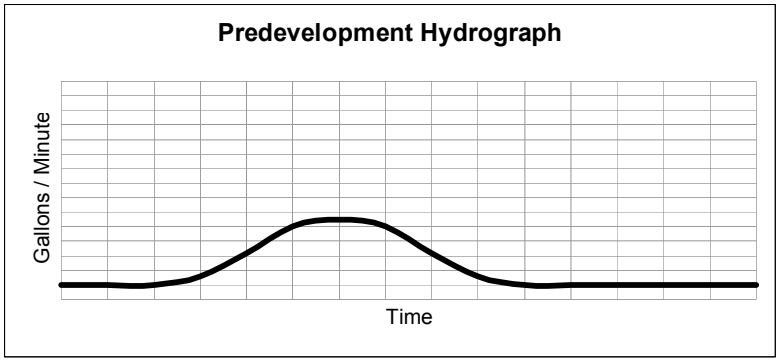


Figure A: Shallow rise and fall

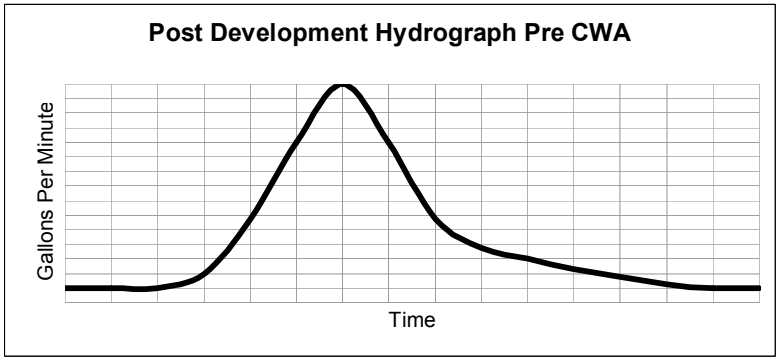


Figure B: Rapid spike with long tail as pipes empty

If one compares the flows following a rain event in these natural systems to what occurs today after human development, one can see vast differences. Studying the hydrograph of a rain event in a pre-settlement vegetation zone, one would note that the flow curve has a gradual rise and fall, which indicates the even flow of the river before, during and after a storm. (Figure A)

Conversely, a stormwater hydrograph from a highly developed system would have an irregular and steep slope due to the increase in impermeable surfaces (Figures B and C). Rather than infiltrating through natural vegetation to the groundwater, rainwater in the developed system moves across impermeable surfaces that are designed to move water quickly into underground storm sewers without infiltrating on site.

In developed systems, rainwater is collected by the gutters and downspouts and either immediately piped to the storm sewer or discharged onto a lawn that may have been treated with any number of chemicals on its way to the storm sewer. In the storm sewer, the rainwater joins the run-off from other impervious surfaces like sidewalks, roads, and ball fields that has picked up contaminants on its way.

There are two types of storm sewer routing systems. These systems can be differentiated by their construction before and after the Clean Water Act (commonly referred to as the CWA) of 1972. By 1987, the Environmental Protection Agency of the US updated the Clean Water Act with the Water Quality Act (WCA) of 1987 that addressed stormwater management laws to minimize non-point source pollution (environmentally harmful chemicals and sediments that move into waterways as runoff from impervious surfaces) (http://www.epa.gov/oecaagct/lcwa.html Mar 26, 2008). If the area in question was designed before the Clean Water Act was implemented, stormwater would likely move through progressively larger pipes (that have replaced streams) and be piped directly into a local wetland or river (Strom, 2004). If you were to create a hydrograph for this scenario you

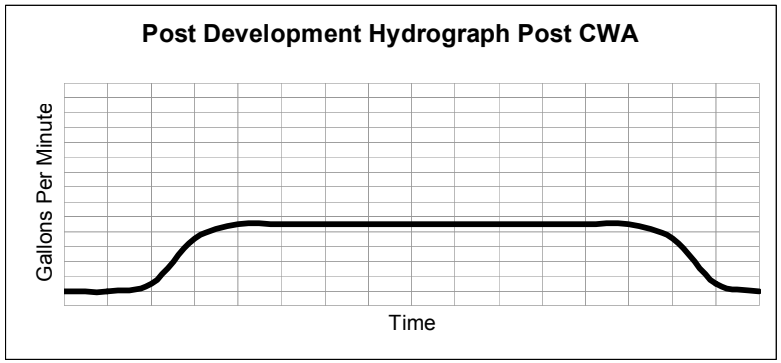
would see a sharp spike in the graph followed by a slow decrease to the base flow as water drains from the pipe systems (Figure B).

The second type of storm sewer, designed to meet CWA regulations, is only slightly more beneficial than the first type of sewer. This type was designed after the Clean Water Act of 1972 and is routed into a holding area called a detention or retention pond. In these retention areas, the rainwater is drained into the same pipes and rivers at a rate that is similar to the water coming off the site before development (Figure C). This is still not a balanced system like the pre-settlement infiltration pattern, and could benefit greatly from ecological designs.

Prior to development, a great portion of the rainwater was intercepted by the leaves of trees or infiltrated through the soil. Only a small portion of the total volume of rain ran off of the site and directly into our streams and rivers (10 – 30%) (Strom, 2004). Asphalt, concrete and roofs are designed to create runoff, 75 – 95 % of the rain that falls on these surface becomes runoff. Grassed areas are not particularly effective either, as 20 – 60% of rainfall becomes runoff.

Since these two cover types make up a great portion of the built environment it is reasonable to expect an increase in volume that is 300-900 percent of predevelopment levels (Strom, 2004). One would see a smooth increase if one graphs this type of outflow, but the peak discharge would continue for a longer period of time as the increased volume of stormwater would require a much longer time to be released (Figure C).

Figure C: Detention limited peak flow, total volume similar between Figure B and C



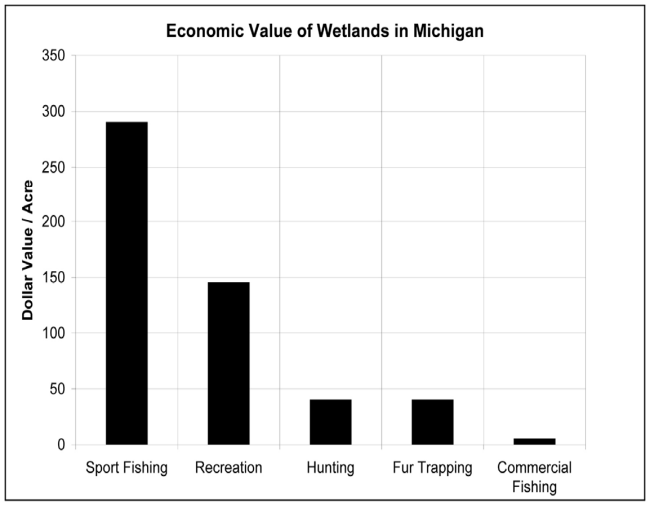


Figure D: Adapted from Jaworski 1978

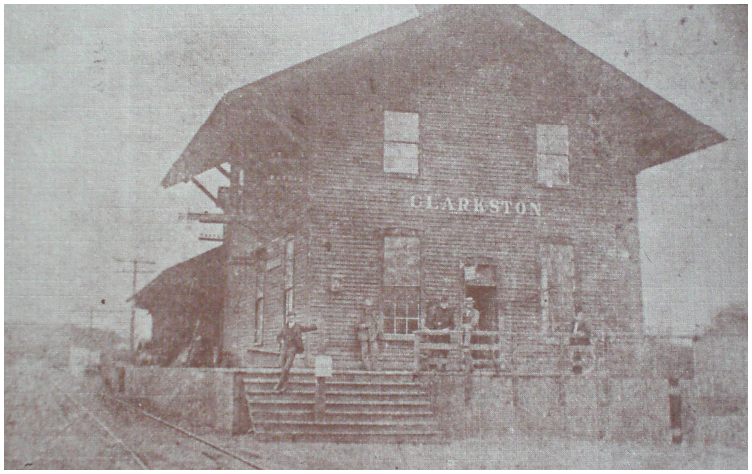
Wetland Value and Development Impact

The negative impacts associated with unchecked runoff include the rapid rise and fall of river levels, and increased land temperature associated with the long discharge of the increased volume of detained water. These effects deeply stress our natural areas and degrade their habitat and aesthetic value. This resource degradation can be seen right in the heart of Clarkston in Depot Park. The wetland that makes up 80% of the park is filled with narrow-leaved cattails and phragmites. These two species are not native to Michigan and are highly invasive and threatening to fragile aquatic ecosystems. These invasive species thrive in nutrient rich waters and have been able to out compete native species in these systems because we have changed the natural conditions of the wetland so drastically through human development.

Intact wetlands are some of Michigan's most diverse habitat areas. A wetland has a wealth of biodiversity that includes a wide variety of animals

and a broad inventory of plants that thrive under these specialized land conditions. Even in a degraded condition, wetlands offer benefits to the surrounding natural systems. They can filter runoff coming into the watershed, buffer streams and rivers during flood conditions, and offer habitat patches in developed areas (although of a diminished quality).

Wetlands have been recognized by designers and naturalists and recently have received protection under the CWA. Even though protected and valued by informed citizens today, wetlands have encountered negative public perception. This has commonly been attributed to the difficulty of access and the perception that they are breeding grounds for mosquitoes and other pests. Through the work of environmental and recreational organizations, this misinformed outlook is beginning to change. In Depot Park, there is a great opportunity to help further enhance the public perceptions of wetlands and increase awareness of their value to both biodiversity and recreation.



Depot Park was named for Depot Road. Depot Road ran from downtown Clarkston to the site of a smaller settlement called Clarkston Station that was formed two miles south of downtown at the intersection of the rail lines, and what is currently called White Lake Road. The depot has been converted to the Village Players Theatre. (Radcliff, 1976)

Analysis

Depot Park is a strong community asset within the city of the Village of Clarkston. The park currently accommodates many civic functions including summer concerts in the park, car shows corresponding with Meadow Brook's Concours d'Elegance, art and craft shows, and the Clarkston Farmer's Market on adjacent property. In addition to these events, the park offers a popular children's playground, space to enjoy lunches, dog-walking opportunities, recreation spaces, and many memorials to veterans and loved ones. The park is also the site of the city offices of Clarkston.

The managed section of the park is currently bisected by the millrace and a new bridge has been constructed that will help to connect the two park spaces. Other recent improvements include a rain garden built near the city offices, a proposed native children's garden adjacent to the playground, and a Veteran's Memorial that helps to buffer the park from traffic along Depot Road.

The park has many valuable over story trees lining the millrace and scattered throughout the open areas that provide shady respite in the summer and beautiful color in the fall. There is a grove on the west side of the park that could be managed and improved to offer increased educational and ecological benefits to the park.

Depot Park also contains an iconic central gazebo that serves as a concert stage, gathering location, and even as a recognizable backdrop for Clarkston prom photos. The roof of the gazebo is beginning to show signs of aging and was recently damaged by a fire. This would be a perfect location to showcase an extensive green roof of sedums in a beloved public location.

The millrace offers a source of water that delights visitors, wildlife, and especially children. Currently, the banks of the millrace show signs of erosion and limit access to the water. Additionally, the banks of the millrace are currently maintained by mowing, and are covered with a shallow rooted non-

native turf that is prone to erosion. Planting native streambank species in this location would promote infiltration while preventing erosion and increasing water quality.

Eroding banks of Millrace new bridge in background (Photo by S. Mattke-Robinson)

The park contains a parking lot that is adjacent to Depot Road that provides easy public access to the park. Additionally, the parking lot serves the city offices and several local businesses in the heart of downtown. This shared parking approach is a positive model that can serve to reduce unnecessary parking in urban areas. With several ecological modifications to the parking lot, rainwater could be handled more responsibly through on-site infiltration and the human parking experience could be enhanced with vegetation.

The park currently does not provide access to the wetland that forms 35 of the 39 acres of the park site. This may be due to the degraded quality of the wetland, which has resulted from dredging of the millrace that bisects the site. This dredging changed the natural water level of the wetland, and this important ecosystem has been further degraded by increased flows of nutrients from runoff and human development along its edges.

The wetland has also suffered from neglect, which has equally negative impacts. The wetland had no clear management scheme developed to protect the native species from the invasion of the exotic species that have currently established themselves (Phragmites, *Phragmites australis,* and Broadleaf cattail,*Typha x glauca or angustifolia)*. With a proper management scheme for the future, this wetland can

still be a beautiful and productive habitat that offers benefits to its ecosystem and the community.

The wetland area of the park has the potential to offer another interactive layer of experience to the park. A boardwalk through the wetland could serve to provide walkers with access to Deer Lake Beach, and offer an educational experience for local schools that could better feature the Clinton River in Depot Park. The bridge across the river at the southern entrance to the park will soon need replacement because of deteriorating foundations due to the rapid rise and fall of the river after major storms. This bridge location currently offers a wonderful view of the Clinton River, and should be reworked as a stronger design element for the park.

The Eastern boundary of Depot Park is comprised of a mix of commercial and residential properties. The park is approximately twenty feet below the grade of the downtown main street at this point and the slope is steeper than 4%.

Steeply sloped Eastern boundary (Photo by S. Mattke-Robinson)

Currently this eastern slope is mown turf that offers little in the way of a buffer for the surrounding properties. Its steepness makes it dangerous for regular mowing maintenance. Much of Depot Park consists of non-native grass that is routinely maintained by mowing. While mowing provides an appearance of care, Depot Park should focus on creating unified planting beds that define the different spaces within the park and promote biodiversity and ecological health.

Clearing notice the mature trees enclosing space (Photo by S. Mattke-Robinson)

The park also features a wonderful clearing bordered on three sides by cottonwoods with an excellent view out over the wetland towards Deer Lake. This space has great potential for a gathering location within Depot Park that can showcase the wetland and promote public education about the ecosystem. Currently, this space is being used as a dumping ground for municipal storage, and contains excess wood, mechanical equipment, and excess winter snow from downtown. The use of this space as a dump detracts from the overall appearance of the well-maintained park and contributes to the perception of this clearing as a hazardous location. By giving this space a defined and inviting purpose while increasing visibility from other areas of the park, this area would be an engaging and safe space that could serve as a location for the first phases of restoration to the wetland.

The entrances to the park are difficult to identify from the road, particularly the southern entrance near the pump house. The intersection of Holcomb Road and Depot Road would be an ideal location to feature welcome signage directly linking to the downtown heart of Clarkston. Current signage within the park is also not cohesive, as many memorials do not share a common treatment for their plaques. Several signs are made from wood while others are made from steel. Memorial plaques should be standardized, and should be made from an affordable, yet durable material that will age well both physically and stylistically. Other signs in the park should also share a common design element and be constructed from similar materials for visual cohesion.

With this in mind there would be hierarchy of signage for entrances, interpretation, memorials etc.

The planting palette for the park currently lacks a guiding theme or structure that neither focuses on natives nor intensive horticulture. It is important to consider the value of native plantings in locations where maintenance will be minimal and invasive or problematic species may not be noticed until they have had the opportunity to spread. As a result, the planting palette for future improvements should be based on native plant communities with a preference for plants grown from locally collected seed (native genotype) when possible. Plants grown from collected seed would also be preferred since this process minimizes impacts compared to harvesting plants from the wild (exceptions can be made when plants are “rescued” from areas that are to be disturbed).

Many of the recent improvements at Depot Park made by the Clarkston Watershed Group have featured native plants and green technologies that begin to create an identity or brand for the park. This is a opportune time to consider sustainable and green options for future plans. Public awareness has continued to grow over the past couple of years to highlight the often negative effects of our human impact on our environment. This awareness is receiving much attention currently, and many design projects aimed at increasing this public awareness and promoting ecological goals are gaining an increase in the availability of federal and local funding. Sustainable design ensures that future generations will have an opportunity to enjoy the same benefits from the environment that we currently enjoy today.

Native plants form the base of the food chain. Many insects and other animals rely native plants for their survival. For example, the Monarch butterfly depends on the presence of *Asclepias* (milkweed) species as their sole larval food source (Tallamy, 2007).

Design

Design overview

This master plan for Depot Park has been shaped by a desire to create enjoyable and memorable spaces that integrate ecological education and protection into the everyday lives of its visitors. The use of sustainable materials and low maintenance plantings allows the city to spend less time and money on maintenance and to focus more time on improving the visitor's experience. Improvements to Depot Park have been carefully designed to promote ecological education, ecological protection, aesthetic enjoyment, ease of maintenance, sustainability, and affordability.

Parking lot

Depot Park is served by a steeply sloping and plantless parking lot adjacent to the city offices. In our design, the parking lot has been updated to reflect a more sensitive approach to stormwater management, using three techniques.

The first technique shows that six parking spaces (less than 10% of the lot) were converted to rain garden beds. These beds were strategically spaced in order to catch a significant portion of the runoff from the parking surfaces. They have also been situated such that tree cover over the lot could be increased. This increased shade over the lot would make the parking experience more enjoyable (cooler cars, beautiful overhead canopy), as well as limit the heat pollution created by large impervious surfaces.

The second parking lot improvement proposes the creation of a covered infiltration trench that connects the new rain gardens and also captures another portion of the stormwater. This trench technique is used in two locations. The first trench runs in the middle of the lot through the double row of parking spaces. This trench allows for a planting of trees down the center of the lot that augment the trees planted in the rain gardens. The second trench lies along the southern curb of the parking lot and runs from rain garden to rain garden ending at the

curb cut at the bottom of the slope. Since both of these trenches are covered, they allow vehicles and pedestrians to move over them, and provide increased stormwater infiltration for the parking lot.

The third parking lot improvement is the proposed conversion of the existing planting beds at the bottom of the slope into rain garden spaces. By using curb cuts and minimal excavation, it would be possible to retrofit these beds on a small budget. All of these techniques are linked to form a primary filter that helps treat the runoff from the parking lot. These are not stand-alone techniques and would still rely on the current stormwater system in some large storm events.

As the parking lot is retrofitted with expanded plantings and advanced rainwater systems, the spaces nearest the city office could be used in an interesting way. Spaces could be designated for carpools and bicycles including bicycle racks. Additionally, a space could be created for electric cars or plug in hybrids that would feature a small solar array and free charging. The associated solar array could take on a sculptural form similar to examples seen in London and Portland.

City office improvements and grounds

Improvements and expansions of the city office building should strongly consider the sustainability of the materials that will be used. The office could be a good candidate for a future metal roof, as they are highly suitable for civic buildings where the initial higher cost is offset by their extreme durability and lasting aesthetic appeal and quality. Other products such as low VOC paints, carpets and furniture can help to increase productivity by creating a healthier work environment.

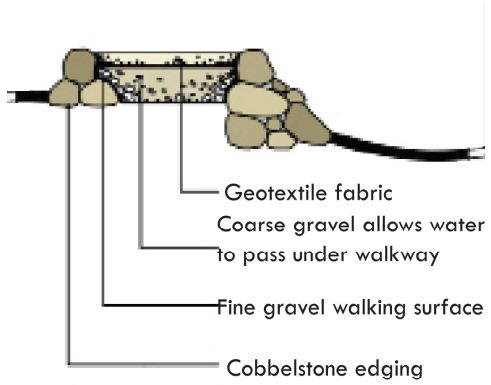
In this design, the grounds adjacent to the office will be converted to a short-grass prairie that is rich in wild flowers that bloom through every season. This type of planting will feature native plants of the area that are less than three feet tall. By using native plantings, the design creates habitat areas in the urban landscape. While these patches may be too small to support large fauna, they can offer great habitat for the birds and insects that larger animals need for survival. A stone buffer can be used around the foundation to act as a maintenance access and a

buffer to keep insects and animals from using the building as habitat.

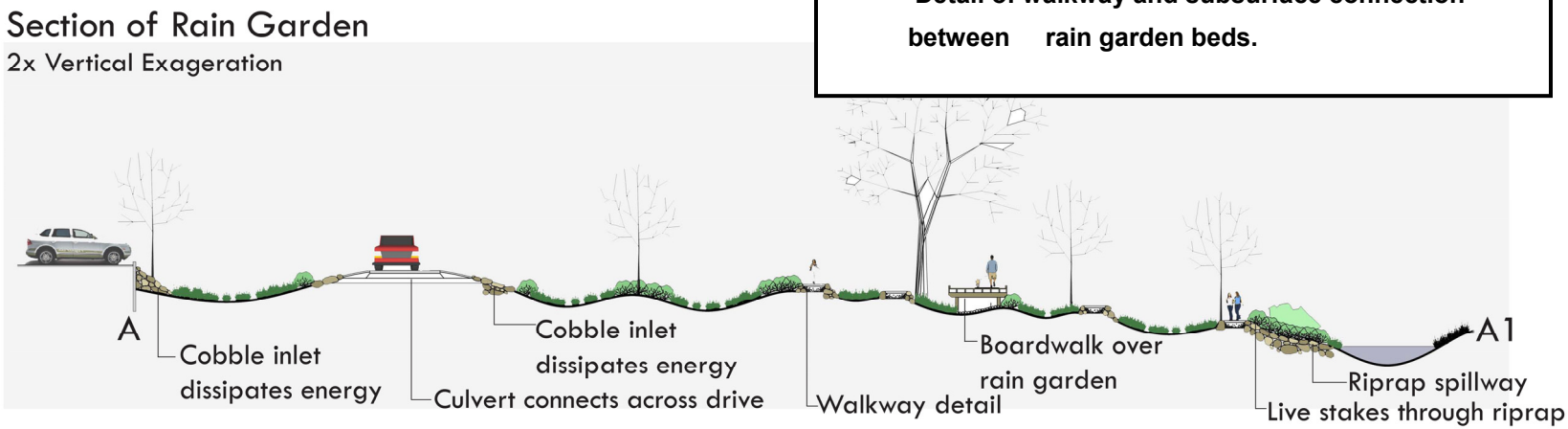
Expanded rain garden

The current rain garden that handles runoff from the north parking lot will be expanded to slow rainwater flows moving toward the millrace and wetland. Extending the current rain garden spaces into a series of stepped beds will promote proper infiltration, and these gardens will be connected through sub-surface outlets. Access pathways will be created between the terraced gardens to encourage circulation and public engagement with the rainwater gardens.

The gardens will contain an expanded variety of raingarden plantings, primarily native to Southeast Michigan, including *Echinacea purpurea* (Purple coneflower), *Liatris spicata* (Blazing star), *Veronicastrum virginicum* (Culver's Root), *Aesclepias tuberosa* (Butterfly weed), and *Eupatorium purpureum* (Sweet Joe Pye weed).



Detail of walkway and subsurface connection between rain garden beds.



Hillside Wave garden

The expansive hillside space on the east side of Depot Park will become an interactive circulation space and a highly attractive showcase for native plantings. Pathways weave beside and through the Wave Garden for public engagement and education. This design showcases large swaths of native plants that incorporate signage along the pedestrian pathway into Depot Park. Plants have been carefully selected to tolerate full sun to partial shade conditions and low soil moisture requirements. These native plants possess strong upright forms and vivid colors that create an attractive visual effect when combined in large swaths.

These broad planting masses are framed uphill by a combination of these native species with a taller prairie grass mix. This less-intensive planting space composes over sixty percent of the wave garden beds, and can be mown once in early spring or in the fall for ease of maintenance. Additionally, existing over story trees and memorial trees will provide attractive vertical elements through the planting beds. By planting the sloping hillside with native species, the Wave Garden design prevents erosion, promotes rainwater infiltration, and inspires visitors to use native species in their own backyards.

Perspective view of Wave Garden

River Rooms

To the South of the Wave Garden, a series of distinct areas adjacent to the Clinton River will be defined as the Clinton River Rooms. Each of these newly distinct spaces will serve as a room that provides a unique experience for the visitor. The first of these rooms contains a small seating area immediately north of the Clinton River bridge. This area will have a small open picnic area with several

benches. It will utilize the slopes along the property boundary as walls that help to focus the view Southwest over the river and down towards the wetland. This area will have ornamental trees and small plantings for visual interest. Tall coniferous evergreen trees that provide winter interest and structure will frame these ornamental species. The smaller open lawn area adjacent to the seating area will be available for a variety of activities from playing catch to sunbathing.

The next river room zone is defined by a large open space that is highlighted by the mature trees that currently exist on site. This area will be used in much the same way that it is currently enjoyed, and it will be one of the largest open spaces within the park. It can function for larger games and playing field space for activities such as Frisbee. Having a large flexible space like this in the park will allow it to meet a more diverse array of functions for the community.

The last of the series of rooms is a small wetland seating area that is surrounded by an existing wetland. This existing patch of wetland vegetation already helps to manage some of the stormwater of the site. The concept behind this wetland river room is to enhance the wetland planting to make the species mix more diverse and interesting. The expanded footprint will help manage additional rainwater while providing a sense of enclosure inside the wetland room. Trees will encircle this area with a rustic council ring providing seating along the edge. This will be the smallest and most private of the series of spaces providing a quiet experience on an intimate scale for the visitor before they reach the wetland overlook. This area will also function particularly well as a small outdoor classroom or a meeting room.

Clinton River Bridge

The existing bridge that crosses the Clinton River on the south end of the park is currently functional, but will require replacement soon because of the footings which are failing. Replacing this bridge provides an opportunity to match the new bridge that crosses the millrace. If the re-designed bridge is situated further back from the river, it would open up more area to stabilize the banks and provide a more natural edge to the river as it enters the park.

Plantings on each side of the bridge will emphasize the entrance to the park and the crossing of the Clinton River.

South Entrance

The south entrance will be maintained and enhanced with plants to help provide ecological habitat and provide a visual and auditory screen from Main Street. The path will be accented with tall grass plantings as one travels north towards the Clinton River Bridge. Adding signs at the road will increase the visibility of the park from Main Street.

Historic West Side

The west side of Depot Park is one of the existing strengths of the park and this plan will act to build on these strengths. The most significant change will be the construction of a green roof for the gazebo; a prominent structure in the park. A highly visible green roof as well as a new path system and native plantings around the base of the gazebo will further enhance this icon of the park. The surrounding lawn has been planned to maintain its ability to function as a space for large events.

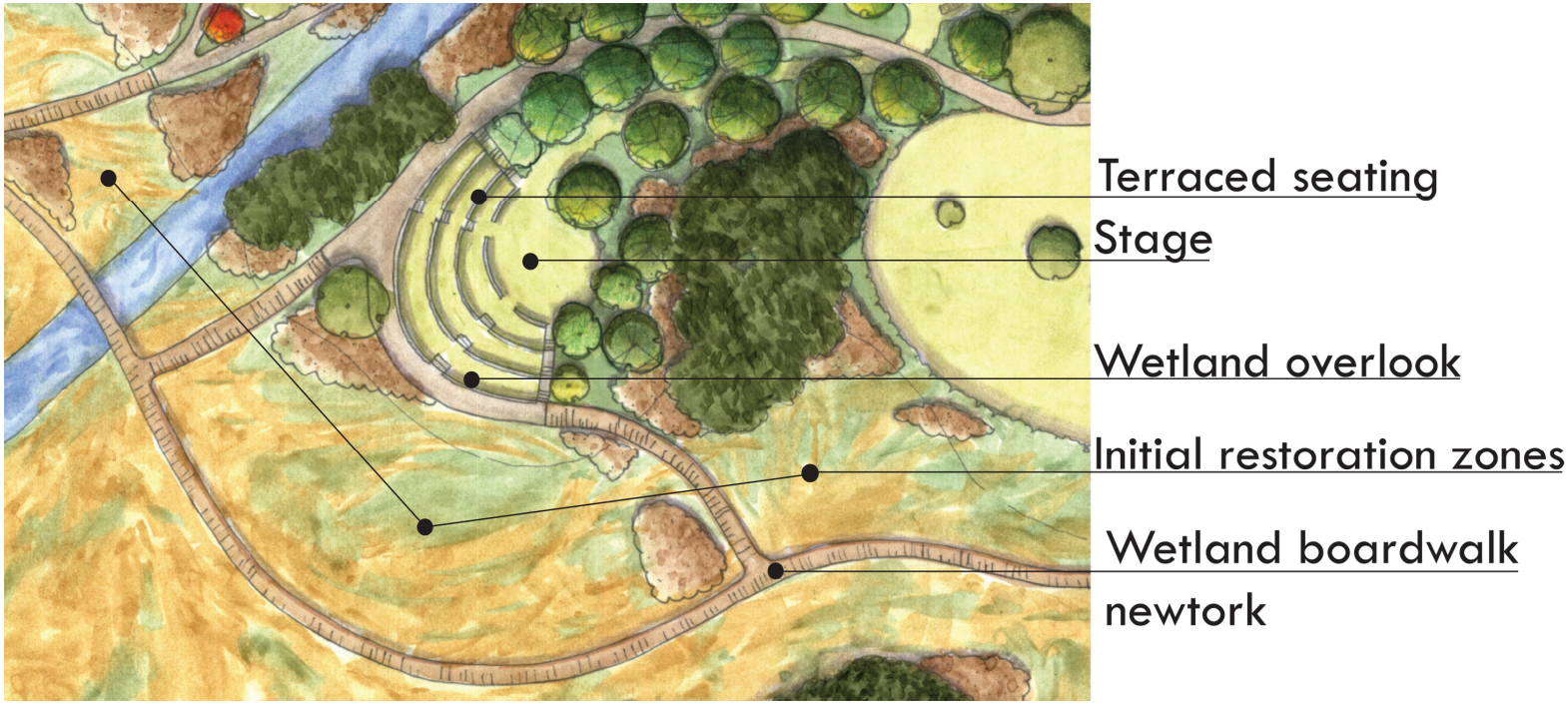
Gazebo with green roof retrofit

Wetland Overlook

This design creates a new room at the heart of the park. This area will feature a universally accessible space for teaching, enjoying small concerts, plays, or other performances, and will create an opportunity for elevated viewing of the

southern wetland ecosystem. This room features two entrance options of a high or low pathway with increased visibility. The high pathway leads up a gently curving earthen ramp that is lined with ornamental trees that provide intense fall color. The pinnacle of this pathway offers an impressive view of the wetland. Wildlife telescopes will be placed along the railing to engage the visitors, and this pathway will continue down ramps at either end of the overlook that connect to the wetland boardwalk.

The lower path is a stabilized turf walkway that leads to a clearing 5 feet lower than the overlook area. The clearing acts as an outdoor stage facing a small amphitheatre. There are three terraced steps in the amphitheatre. The lowest terrace is a small step above the stage area and is accessed by four gently sloping ramps. The other three terraces are accessed by climbing a small set of stairs that lead to the overlook and the grove of trees to the rear of the stage acts as a seasonally changing backdrop.



Wetland Boardwalk

The wetland holds great potential to be a key area of the park but is currently an uncelebrated resource of Depot Park. The wetland has become filled will sediment and invasive plants, due to lack of a systematic management plan. As public knowledge about the importance of ecological systems has increased, we have come to realize that wetlands are some our most valuable and productive ecosystems. Wetlands provide important fish and plant habitats and can improve water quality, and are integral systems that need to be protected and enhanced.

The wetland boardwalk in Depot Park will bring visitors out to the edge of the wetland, engaging them in the variety of a wetland experience without compromising the ecological health of the overall wetland. Along with the wetland overlook, the boardwalk will bring visitors in contact with this valuable resource and reveal it's beauty and importance to the public. The goal is to restore the entire wetland over time, but this is an ambitious project that will take time to implement. Once more attention is focused on this area, and people are more aware of this wonderful hidden resource in their community, they will be motivated to restore the many acres of wetland. The wetland boardwalk is the first step in beginning this process.

Wetland Restoration Tactics

Another benefit to the boardwalk is that it creates several manageable zones where restoration of the wetland can begin. By restoring the small niches formed between the upland area of the park and the boardwalk, one can create a startling contrast on either side of the boardwalk. The difference between the stark monoculture of the invaded sections and the diverse beauty of the restored areas should help to generate interest in the restoration of the larger wetland area. By restoring these islands, one also creates a source of native seed that will be available when other restoration efforts are undertaken.

Millrace and Streambank Stabilization

Throughout the park there are many areas where water and solid ground interface. This is a very

important area for many reasons, and often this is an area of high ecological productivity. There are species of plants and animals found in this transition zone that are not found anywhere else on a given site or in a particular area. This is also an area that is prone to erosion, and, with water quality being an issue in this region, ensuring that the slopes leading into the water are stabilized to reduce the amount of sediment that enters moving water bodies is an important ecological priority.

Steep or degraded sections of the streambank and millrace should be stabilized with live staking and the use of appropriate plants. Using cuttings of particular species of plants, like some dogwoods and willows, that are driven into the ground like stakes and allowed to root and regenerate will act to stabilize the stream banks and provide more native vegetation and habitat for the area. If these areas along the stream banks are not secured and are allowed to continue to degrade, sedimentation will increase and additional prime habitat for invasive species will be created.

View into woodland wildflower garden showing flowering understory trees and spring wildflowers.

Woodland Wildflower Garden

The existing grove to the West of the millrace provides a wonderful native woodland ecosystem for Depot Park. This existing ecosystem can be highlighted with new native woodland wildflowers that populate shady locations. Spring ephemerals such as *Mertensia virginica* (Virginia bluebells), *Claytonia virginica* (spring beauty), *Uvularia grandiflora* (large-flowered bellwort) can be planted with *Aquilegia canadensis* (wild columbine), *Caulophyllum thalictroides* (Blue cohosh), *Polygonatum biflorum* (giant Solomon's seal), and shade-loving ferns such

as *Athyrium felix-femina* (lady fern). This new woodland wildflower garden can become a showpiece of shade-loving species that can educate and inspire visitors to use these native plants in their gardens.

Holcomb and Depot Intersection

The intersection of Holcomb and Depot Roads is a section of Depot Park that receives a large input of stormwater from the surrounding roads and community. Much of this stormwater moves in through the boundary at this location, and deposits pollutants and sediments into the wetland. Additional rain gardens will be planted along the pedestrian paths on the east side of Holcombe Road that can help slow and infiltrate some of the rainwater entering the site. The addition of these rain gardens will also add visual interest to the west side of the park along the road. Suitable plants for this area can be found in the master species list provided along with this document. Additionally, a sign placed in this rain garden can increase the visibility of this park to Holcomb's pedestrian and vehicular traffic.

Tall Grass Areas

Tall grass areas feature a mix of prairie grasses, native forbs and shrubs. They are used in this design to define rooms and act as buffers for neighbors and habit areas. The tall grass areas also beneficially function as buffers to reduce nutrient flows in sensitive areas. Due to their deep roots and rough texture, these prairie plants can increase healthy rainwater infiltration and can act as a filter that helps reduce the impact of excess nutrients on sensitive areas.

Mown Areas

In the mown areas of the park, maintenance could be further reduced by using alternative turf types such as Sheep Fescue, Buffalo Grass, Pennsylvania Sedge or another low growing turf. These species all reach a maximum height of four inches and should require only annual mowing compared to the frequent mowing required by a typical turf lawn.

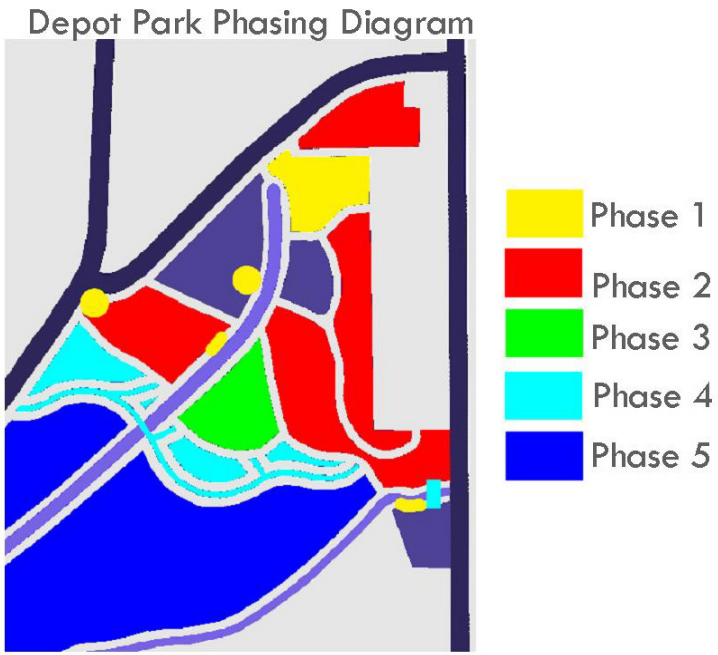
Memorial Plantings

Depot Park has a tradition of having memorial plantings in the park. The park has a rich historical past that includes agriculture, industry, and personalities such as Henry Ford, and this tradition should be embraced and expanded as the future and past are combined together in Depot Park. Throughout the park the ornamental native trees will be used as focal points and these trees should be used as the memorial trees. This will contribute to the park with a gift that will grow with the park and serve as a reminder of the past.

Path Surfaces

The path system in the park spans the entire site and successfully unites the newly defined areas and provides access for all visitors. As Depot Park becomes an ecological showcase for the community, paths should be reconstructed with porous paving where appropriate. Porous paving allows stormwater to infiltrate within the path system, which minimizes the amount of impervious surfaces on site. This will allow people to understand different options for paving along with interpretive signs that explain the benefits of porous paving and rainwater infiltration. Maintenance of the path system should be considered as well when examining materials to be used as paths in the park.

Phasing



Phase I- Enhance existing rain gardens, Holcomb and Depot Intersection, create small test areas of streambank stabilization, replace existing gazebo roof with green roof

Phase II- Wave gardens, river rooms, parking lot retrofit, west side trail and woodland improvement

Phase III- Wetland Overlook

Phase IV –Boardwalk, Clinton River bridge

Phase V – Complete Wetland Restoration

As the City of the Village of Clarkston and other community organizations think about how they might move forward and implement the plans provided here, there are a number of ways these projects can be subdivided. The preceding phasing diagram illustrates one possible combination. Actual implementation will be influenced by funding sources (grants, city and donors) and should look to maximize impact per dollar. Several of these projects could be implemented in stages. The wave garden beds could be seeded with a native prairie mix for roughly $500 plus labor. Once additional funding was available the individual beds at the base of the slope could be planted.

Further Research

Depot Park can and will continue to change and adapt to the meet the needs of the community it serves. There are many resources that the community can draw upon, including private grants and student projects. The following is a short list of some ideas for further research and additional projects:

- Fundraising and national/local grant writing
- Environmental education activities within the park
- Wetland restoration plan
- Construction documentation of designs
- Interpretive signs
- Stream assessments

Conclusion

Depot Park has served the community of Clarkston for years as a place for community members and visitors to celebrate, activate, and rejuvenate. It has a great opportunity in the near future to become a location to educate and inspire the public about caring for their environment through ecological design. It is important that the residents of Clarkston invest in the future of Depot Park and support a cohesive park design that focuses on making Depot Park a memorable place for the community. Depot Park will educate the public about ways to make changes to their own property that will improve the community that surrounds and shares the park. The documents that have been provided help share the future vision of Depot Park. With enthusiasm and care from the surrounding community and the Clarkston Watershed Group, Depot Park can continue to evolve into a memorable green heart for the village of Clarkston.

Thank You

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References and Further Links

Papers and Books

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Strom S, Nathan K. Site Engineering for Landscape Architects. Wiley and Sons, New York, NY 2004

Tallamy D. Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens. Timber Press, Portland, OR 2007

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Planning Information and Support

Springfield Township Native Vegetation Enhancement Project
http://www.epa.gov/ecopage/springfieldtwp/index.html

Springfield Township Native Plants CD 248-634-3111

City of Ann Arbor, Natural Area Preservation Abridged List of Recommended Species Native to SE Michigan
http://www.a2gov.org/government/publicservices/fieldoperations/NAP/NativePlants/Pages/NativePlants.aspx

Michigan Department of Environmental Quality: Streambank stabilization manual
http://www.deq.state.mi.us/documents/deq-swq-nps-sbs.pdf

City of Lansing: Michigan Ave rain gardens
http://www.cityoflansingmi.com/pubserv/cso/michigan_ave_rain_gardens.jsp

Rain Gardens of Western Michigan
http://www.raingardens.org/Index.php

Wisconsin Department of Natural Resources: Rain gardens
http://dnr.wi.gov/runoff/rg/links.htm

The Low Impact Design Center
http://www.lowimpactdevelopment.org/
Rain garden templates
http://www.lowimpactdevelopment.org/raingarden_design/links.htm

Real Goods and the Solar Living Center
http://www.realgoods.com/
http://www.solarliving.org/

Michigan State University Agricultural Extension Oakland County
http://www.msue.msu.edu/portal/default.cfm?pageset_id=28354

The University of Connecticut Plant Database
http://www.hort.uconn.edu/Plants/

Virginia Tech Department of Dendrology
http://www.cnr.vt.edu/DENDRO/dendrology/links.htm

Native Plants Nurseries

Michigan Native Plants Producers Association
http://www.mnppa.org/

American Roots
1958 Hidden Lake Trail
Ortonville, MI 48462
PH. (248) 627 – 8525 or (248) 882 – 7768
Fax (248) 627 – 3865

Oakland Wildflower Farm
520 North Hurd Rd.
Ortonville, MI 48462
PH. (248 969 – 6904
http://www.oaklandwildflowerfarm.com/

Wildtype Native Plant Nursery
900 N. Every Road
Mason, MI 48854
Ph: (517) 244-1140, Fax: (517) 244-1142
http://www.wildtypeplants.com/

Government and Local Organizations

The Clinton River Watershed Council
http://www.crwc.org/info/about.html

Wild Ones
www.for-wild.org

North Oakland Headwaters Land Conservancy
http://www.nohlc.com/

Oakland Land Conservancy
http://www.oaklandlandconservancy.org/

Southeast Michigan Council of Governments
http://www.semcog.org/

East Michigan Environmental Action Council
http://www.emeac.org/

Wildflower Ascoiation of Michigan
www.wildflowersmich.org

Michigan Environmental Council
http://mecprotects.org/

Michigan Department of Natural Resources
http://www.michigan.gov/dnr

Michigan Association of Conservation Districts
http://www.macd.org/rollovers/nativeplants/nphome.html

Michigan Rivers Alliance
http://www.michiganrivers.org/

The Urban Creek Council
http://www.urbancreeks.org/

The Center for Watershed Protection
http://www.cwp.org/