

2.0 GROW ZONES

2.1 DETROIT PARKS: ELIZA HOWELL PARK AND RIVER ROUGE PARK

2.1.1 INTRODUCTION

Eliza Howell Park and River Rouge Park (Rouge Park) form a riparian corridor in the Rouge Main 3-4 Subwatershed. Rouge Park is the City of Detroit's largest park at 1,181 acres and includes 6.13 linear miles of the Rouge River's Main Branch. It has as an abundance of recreational opportunities, is home to varied wildlife and has over 15 acres of restored native prairie and native areas. Eliza Howell Park is a 200-acre park with 3.77 linear miles of the Rouge River and contains the river's main stem and the confluence of Rouge River's Upper Branch and Main Rouge River.

Both parks are adjacent to residential neighborhoods in heavily urbanized areas; however, the riparian corridor within the parks is moderately intact and seasonally flooded which provides an important connection to the river. Both parks are the focus of neighborhood efforts to maintain and restore the parks, by residents and groups such as Friends of the Rouge, Friends of Rouge Park and Friends of Eliza Howell Park. In Eliza Howell Park, residents installed a nature trail that runs from the park, along the river and into the residential area. The neighborhood works with the Detroit Audubon Society, Friends of Eliza Howell Park and others to organize bird watches, butterfly watches and to identify native plants. In Rouge Park, the Greening of Detroit brings Detroit Public School students to the prairie to observe the changes over the seasons. Rouge Park is the site of one of the largest Rouge Rescue events, held annually every June, and hosts up to 200 children who pull invasives, plant native plants and engage in other activities.

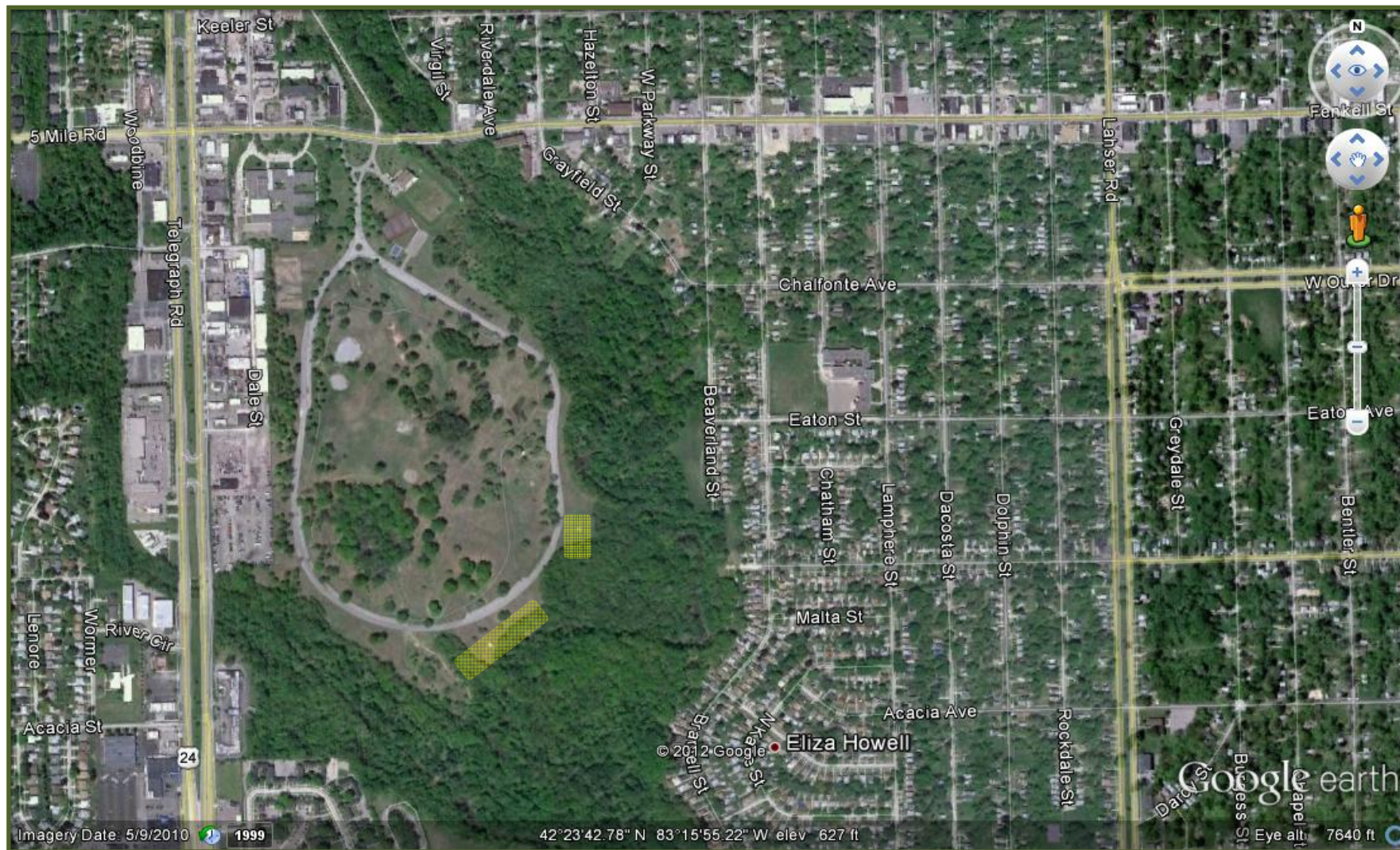
As part of *Transforming the Rouge* project, approximately five acres of prairie was restored in Rouge Park and five acres of turf grass and native plants in Eliza Howell Park was restored to native vegetation grow zones through controlled burns and seed installation.

Site investigation and reconnaissance of the parks was conducted to take photographs and assess the proposed seeding areas on October 27, 2010.

Aerial photographs and computer-aided design software was used to complete the design and layout of the seeding areas. Figure 2-1 shows the aerial of Eliza Howell and Figure 2-2 shows the Eliza Howell Park Design. Figure 2-3 shows the Rouge Park Aerial and Figure 2-4 shows the Rouge Park Design. Final construction contract plans and specifications which included general design standards, construction cost estimate, and type and quantity of plants were finalized in early 2011.

The controlled burns and seeding activities were implemented in the spring of 2012. Follow-up and inspection activities occurred during the summer and fall of 2012.

Figure 2-1: Eliza Howell Park Aerial



- Project Areas

An aerial photograph of a landscape featuring a road, a pedestrian path, and several areas marked with yellow hatching. The hatched areas are labeled as 'NATIVE PLANTING AREA EXISTING VEGETATION TO BE REMOVED BY PRESCRIBED BURN AND SEEDED WITH NATIVE SEED'. A dashed line along the road is labeled '10' WIDE MOWED BUFFER'. A solid line is labeled 'EXISTING PEDESTRIAN PATH'. The landscape includes green trees and grassy areas.

0 40' 80' 160'

SCALE: 1" = 80' @ 22x34



0 250' 500' 1000'

SCALE: 1" = 500' @ 22x34

PRAIRIE SEED MIX (5.0 ACRES)		
SCIENTIFIC NAME	COMMON NAME	LBS/A
ALLIUM CERNUUM	NODDING WILD ONION	0.063
AGROPYRON TRACHYCAULUM	SLENDER WHEAT GRASS	1.000
ANDROPOGON SCOPARIUS	LITTLE BLUESTEM	3.009
ASCLEPIAS TUBEROSA	BUTTERFLY WEED	0.094
ASTER LAEVIS	SMOOTH BLUE ASTER	0.188
ASTER NOVA-ANGLIAE	NEW ENGLAND ASTER	0.125
AVENA SATIVA	COMMON OAT	22.00
CAREX BICKNELLII	BICKNELL'S OVAL SEDGE	0.063
CASSIA FASCICULATA	PARTRIDGE PEA	0.398
COREOPSIS LANCEOLATA	SAND COREOPSIS	0.450
COREOPSIS TRIPERTIS	TALL COREOPSIS	0.125
ELYMUS CANADENSIS	NODDING WILD RYE	1.000
HELIOPSIS HELIANTHOIDES	EARLY SUNFLOWER	0.188
LESPEDEZA CAPITATA	ROUNDHEAD BUSHCLOVER	0.094
LIATRIS ASPERA	ROUGH BLAZING STAR	0.125
LOLIUM MULTIFLORUM	ANNUAL RYE	6.000
LUPINUS PERENNIS	LUPINE	0.180
MONARDA FISTULOSA	BERGAMOT	0.063
PENSTEMON DIGITALIS	FOXGLOVE BEARDTONGUE	0.125
PHYSTOSTEGIA VIRGINIANA	FALSE DRAGONHEAD	0.031
POTENTILLA ARGUTA	PRAIRIE CINQUEFOIL	0.063
PYCNANTHEMUM VIRGINIANUM	COMMON MOUNTAIN MINT	0.125
RATIBIDA PINNATA	YELLOW CONEFLOWER	0.500
RUDECKIA HIRTA	BLACK-EYED SUSAN	0.250
SILPHIUM TEREBINTHINACEUM	PRAIRIE DOCK	0.020
SOLIDAGO GRAMINIFOLIA	GRASSLEAFED GOLDENROD	0.031
SOLIDAGO NEMORALIS	OLD-FIELD GOLDENROD	0.125
SOLIDAGO RIDDELLII	RIDDELL'S GOLDENROD	0.094
SOLIDAGO RIGIDA	STIFF GOLDENROD	0.125
SOLIDAGO SPECIOSA	SHOWY GOLDENROD	0.125
VERBENA STRICTA	HOARY VERVAIN	0.250
VERNONIA MISSOURICA	COMMON IRONWEED	0.125
VERONICASTRUM VIRGINICUM	CULVER'S PHYSIC	0.010
ZIZIA AUREA	GOLDEN ALEXANDER	0.063
	TOTAL	37.218

1. ALL APPLICABLE PERMITS MUST BE OBTAINED BEFORE IMPLEMENTATION.
2. NO GRADE CHANGE IS PROPOSED.
3. ALL TRIBUTARIES, RIVERS, STREAMS, WETLANDS ETC. SHALL BE PROTECTED FROM THE DISCHARGE OF FLUIDS, SOILS OR MATERIALS.

1. THE OBJECTIVE OF THE PRESCRIBED BURN IS TO REMOVE EXISTING GRASS IN PREPARATION OF NATIVE PLANTINGS.
2. ONLY TRAINED AND QUALIFIED INDIVIDUALS SHALL BE AUTHORIZED TO CONDUCT THE BURN UNDER THE GUIDANCE OF A BURN PLAN. BURN CREWS SHALL WEAR CLOTHING MADE OF NATURAL MATERIALS (COTTON, WOOL, LEATHER, ETC.) CAP, GLOVES, AND HIGH TOP BOOTS. IF POSSIBLE, ALL MEMBERS OF THE BURN CREW SHOULD WEAR FIRE RETARDANT, NOMEX CLOTHING.
3. THE PRESCRIBED BURN SHALL BE IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS. ADJOINING LANDOWNERS WILL BE NOTIFIED PRIOR TO THE BURN
4. EXPECTED WEATHER CONDITIONS, UTILITIES, PEDESTRIAN AND VEHICULAR TRAFFIC THAT MAY BE IMPEDED BY HEAT OR SMOKE, LIABILITY, AND HEALTH AND SAFETY PRECAUTIONS SHALL BE INTEGRATED INTO THE TIMING, LOCATION, AND EXPECTED INTENSITY OF THE BURN. OBTAIN THE LATEST SITE SPECIFIC WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE.
5. TIMING OF THE BURN WILL COMMENSURATE WITH SOIL AND SITE CONDITIONS TO MAINTAIN SITE PRODUCTIVITY AND MINIMIZE EFFECTS ON SOIL EROSION AND SOIL PROPERTIES. BURN EXISTING VEGETATION WHEN IT IS DRY ENOUGH TO HOLD A FIRE BUT WHILE THE SOIL IS STILL DAMP TO TOUCH.
6. DO NOT BURN WHEN WIND VELOCITIES ARE LESS THAN 5 MPH OR GREATER THAN 15 MPH OR WHEN WINDS ARE GUSTY OR SHIFTING MORE THAN 45 DEGREES IN DIRECTION.
7. PRIOR TO THE BURN, FIREBREAKS WILL BE ESTABLISHED TO SEPARATE THE BURN AREA FROM PROTECTED AREAS. FIREBREAKS SHALL BE TWICE AS HIGH AS THE TALLEST ADJOINING HERBACEOUS MATERIAL AND NEVER LESS THAN SIX FEET WIDE.

1. SEED SHALL EITHER BE COLLECTED LOCALLY BY VOLUNTEERS OR SUPPLIED COMMERCIALY IN THE QUANTITIES SHOWN.
2. SOW SEED WITH A BROADCASTER, SEED DRILL OR BY HAND AND LIGHTLY RAKE TO PROVIDE ADEQUATE SEED SOIL CONTACT.
3. DO NOT COVER SEED MORE THAN 1/4" DEEP WITH SOIL.
4. COVER SEED WITH A 1" MAXIMUM THICK STRAW MULCH LAYER OR USE EROSION CONTROL MAT ON SLOPES 3:1 OR STEEPER.
5. OPTIMUM SEEDING SCHEDULE IS AFTER MAY 1, (WHEN SOIL IS FREE OF FROST AND IN WORKABLE CONDITION), BUT BEFORE JUNE 15 OR AFTER OCTOBER 1, BUT BEFORE NOVEMBER 30 (OR PRIOR TO FREEZE-UP) OR AS DIRECTED BY CONSULTANT.

SEEDING - FIRST YEAR

1. WATERING: FOR OPTIMUM PLANT GROWTH, PLUGS AND SEED SHOULD BE KEPT MOIST (1" OF TOTAL WATER PER WEEK, INCLUDING RAINFALL) UNTIL VEGETATION IS 4" HIGH TYPICAL.
2. MOWING: KEEP THE VEGETATION MOWED TO A HEIGHT OF 4-6 INCHES AND MOW WHEN THE VEGETATION REACHES 10-12 INCHES. THIS MAY REQUIRE MOWING ABOUT ONCE A MONTH DEPENDING ON THE AMOUNT OF RAINFALL. STOP MOWING AT THE END OF THE GROWING SEASON (SEPTEMBER).
3. NON-NATIVE SPECIES CONTROL: SPOT SPRAYING OR HAND WICKING HERBICIDE APPLICATION MAY BE REQUIRED TO DETER AGGRESSIVE PERSISTENT NON-NATIVE SPECIES. AVOID CONTACT WITH NATIVE SEEDLINGS.
4. GENERAL MAINTENANCE: IF BARE AREAS OCCUR ADDITIONAL SEEDING MAY BE NECESSARY. PERIODICALLY INSPECT FOR DEBRIS AND/OR EROSION AND ADDRESS AS REQUIRED.

1. KEEP THE VEGETATION MOWED TO A HEIGHT OF 8 INCHES AND MOW WHEN THE VEGETATION REACHES 12-18 INCHES. STOP MOWING AT THE END OF THE GROWING SEASON (SEPTEMBER).
2. NON-NATIVE SPECIES CONTROL: HAND PULLING AND SPOT TREATMENTS OF HERBICIDE MAY BE NEEDED DURING THE SECOND YEAR. COMMON COMPETITIVE WEEDS IN THE SECOND YEAR INCLUDE SPOTTED KNAWEED, CANADA THISTLE, BURDOCK, WILD PARSNIP, SWEET CLOVER, AND QUEEN ANNE'S LACE.

1. BURNING/MOWING: A PRESCRIBED BURN SHOULD OCCUR IN MARCH OR APRIL BY EXPERIENCED, TRAINED CREWS. CHECK WITH LOCAL FIRE REGULATIONS AND OBTAIN THE APPROPRIATE PERMITS. IF BURNING IS NOT AN OPTION, MOW CLOSE TO THE SURFACE (4 INCHES) IN EARLY SPRING (FEBRUARY THROUGH APRIL) AND USE A RAKE TO REMOVE THE CLIPPINGS. IF REMOVAL OF CLIPPINGS IS NOT POSSIBLE, RAISE MOWING HEIGHT TO 8 INCHES.

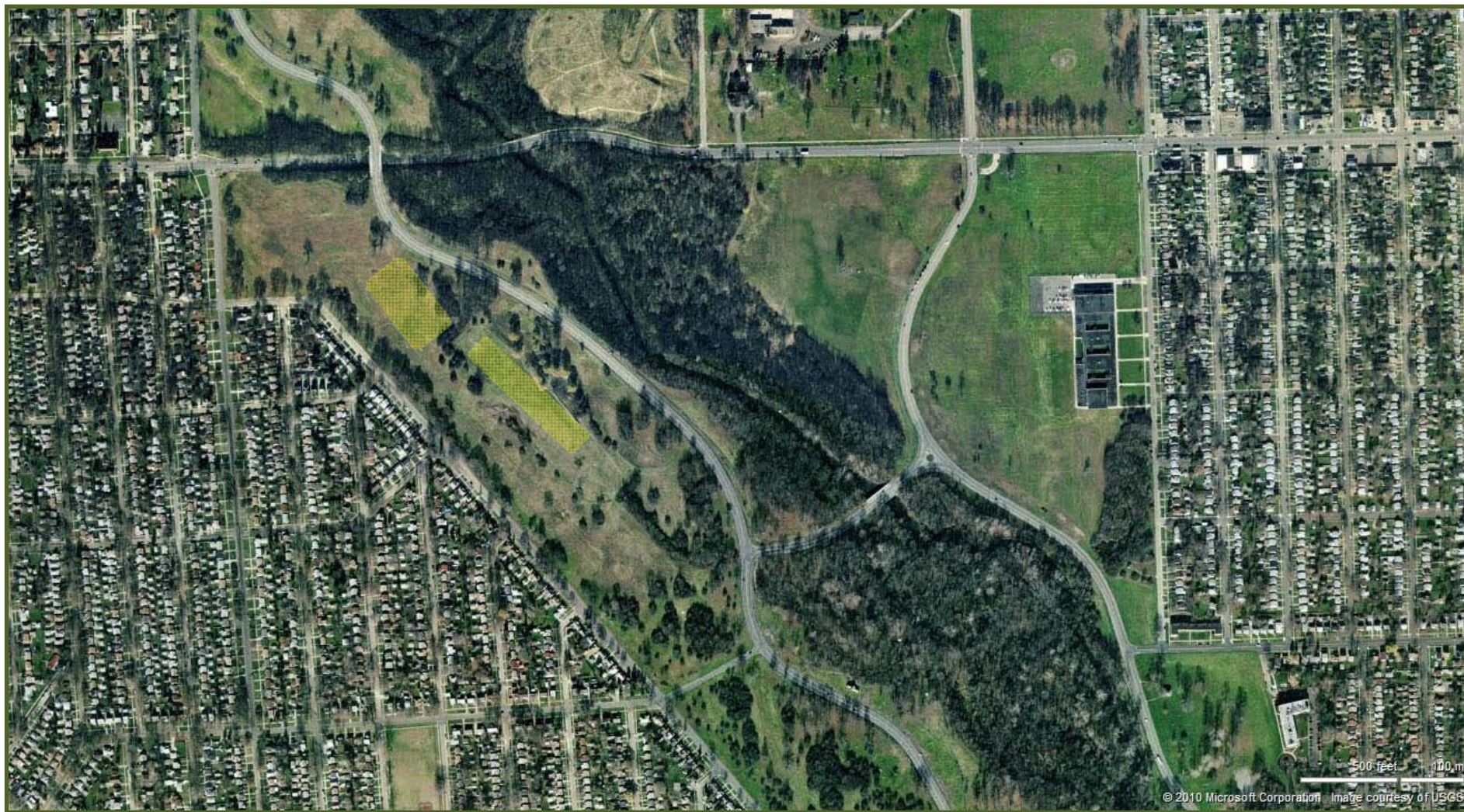
AFTER THE THIRD YEAR, BURNING SHOULD TAKE PLACE EVERY ONE TO THREE YEARS. CONSIDER A BURN ROTATION IN WHICH 1/2 OR 1/3 OF THE AREA IS BURNED ONE YEAR AND ANOTHER SECTION BURNED THE NEXT YEAR.

2. **NON-NATIVE SPECIES CONTROL** - **INSPECT AND REMOVE INVASIVE SPECIES AS NECESSARY. THIS MAY INCLUDE HERBICIDE APPLICATION, CUTTING, OR PULLING BY HAND AS DETERMINED BY THE SPECIES. SPOT TREATING WITH HERBICIDE MAY STILL BE NEEDED IF WEEDS PERSIST.**

3. GENERAL MAINTENANCE: IF BARE AREAS OCCUR ADDITIONAL SEEDING MAY BE NECESSARY. PERIODICALLY INSPECT FOR DEBRIS AND/OR EROSION AND ADDRESS AS NECESSARY.



Figure 2-3: Rouge Park Aerial



- Project Areas

±240'

±325'

±120'

±740'

±185'

NATIVE PLANTING AREA (APPROXIMATELY 2 ACRES)
EXISTING VEGETATION TO BE REMOVED BY
PRESCRIBED BURN AND SEEDED WITH NATIVE SEED MIX

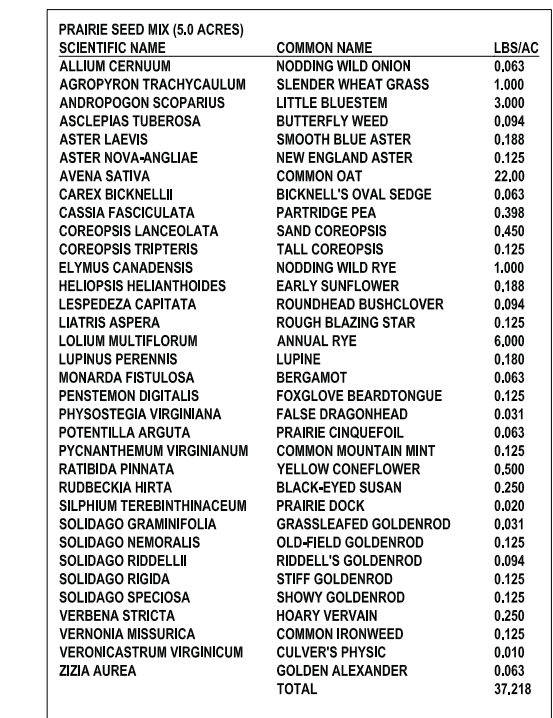
NATIVE PLANTING AREA (APPROXIMATELY 3 ACRES)
EXISTING VEGETATION TO BE REMOVED BY
PRESCRIBED BURN AND SEEDED WITH NATIVE SEED MIX

W. OUTER DRIVE

PARKLAND STREET

0 40' 80' 160'

SCALE: 1" = 80' @ 22x34



1. AFTER THE THIRD YEAR, BURNING SHOULD TAKE PLACE EVERY ONE TO THREE YEARS. CONSIDER A BURN ROTATION IN WHICH 1/3 OR 1/2 OF THE AREA IS BURNED ONE YEAR AND ANOTHER SECTION BURNED THE NEXT YEAR.
2. NON-NATIVE SPECIES CONTROL - INSPECT AND REMOVE INVASIVE SPECIES AS NECESSARY. THIS MAY INCLUDE HERBICIDE APPLICATION, CUTTING, OR PULLING BY HAND AS DETERMINED BY THE SPECIES. SPOT TREATING WITH HERBICIDE MAY STILL BE NEEDED IF WEEDS PERSIST.
3. GENERAL MAINTENANCE: IF BARE AREAS OCCUR ADDITIONAL SEEDING MAY BE NECESSARY. PERIODICALLY INSPECT FOR DEBRIS AND/OR EROSION AND ADDRESS AS NECESSARY.

2.1.2 CONTROLLED BURNS AT ELIZA HOWELL PARK AND ROUGE PARK

Controlled burns at both sites were conducted on April 11, 2012 to eliminate the existing vegetation and prepare the site for seeding. ARC staff subcontracted with PlantWise, LLC, a professional burn consultant, to create a burn plan, prepare the site, notify necessary authorities, and prepare burn breaks as required. Burn Plans for both parks are included as Attachment A and are provided at the end of this section. Temperature, humidity, wind speed and direction and weather were all taken into consideration prior to scheduling the burn dates. An Invasive Species Management Plan for Burn Units at Detroit's Eliza Howell Park and Rouge Park is included at the end of this section as Attachment C.

Given the close proximity to homes and businesses, public outreach and education was provided to Detroit neighborhood organizations through public meetings, workshops and fact sheets. A more thorough description of the public education efforts for this project is explained in the public education chapter of this report.

PROPOSED BURN LOCATIONS – October 27, 2010



South east end of Eliza Howell Park



Adjacent to Eliza Howell Park nature trail



Rouge Park prairie south end



Rouge Park prairie north end

CONTROLLED BURN AT ROUGE PARK – April 11, 2012



CONTROLLED BURN AT ROUGE PARK – April 11, 2012 (Continued)



City of Detroit Fire Marshall and residents observe the burn at Rouge Park



Rouge Park prairie post-burn



Rouge Park prairie post-burn

ELIZA HOWELL PARK CONTROLLED BURN – April 11, 2012



Controlled burn adjacent to the nature trail



Controlled burn in the middle of the site



Controlled burn at full force



Friends of Eliza Howell Park members observed the burn



Post-burn at the nature trail entrance



Post-burn looking at the project site

2.1.3 SEEDING AT ELIZA HOWELL PARK AND ROUGE PARK

A request for seed quotes was sent out to four potential suppliers on January 30, 2012. The native seed suppliers contacted were Cardno JFNew, Native Connections, Nativescape and Michigan Wildflower Farm. Based on lowest bid and past experience, Nativescapes, LLC was chosen as the supplier of the native seed mix for Eliza Howell Park and Rouge Park in March 2012.

A prairie seed mix consisting of 32 species of native grasses and wildflowers were hand-broadcast by student volunteers in the burned areas to improve the overall plant diversity at the parks. Seeds were pre-mixed with sand as a carrier agent to help with dispersal and then transferred to paper bags to be given to the students. Students were evenly spaced at the edge of the seeding areas and hand-broadcast the seed as they walked. Bags were refilled as needed. The Alliance of Rouge Communities partnered with the Greening of Detroit to engage Detroit Public School students to seed Rouge Park. On April 17-18 2012, middle school students from Neinas and Priest schools seeded Rouge Park with the help of Greening of Detroit and ARC staff. On May 4, 2012, students from Murphy Middle School, a Detroit Public School adjacent to Eliza Howell Park, participated in seeding the park along with Greening of Detroit, Friends of the Rouge and ARC staff.

SEEDING ACTIVITIES CONDUCTED AT ROUGE PARK: April 17-18, 2012



Neinas School students preparing to distribute seed



Neinas School students lining up to distribute seed



Neinas School students distributing seed



Neinas School students distributing seed



Neinas School students distributing seed



Neinas School students running across seeded area to tamp it in

SEEDING ACTIVITIES CONDUCTED AT ELIZA HOWELL PARK: May 4, 2012



See Preparation



Detroit Murphy Middle School students inspecting the seed



Detroit Murphy Middle School students lining up to seed



Detroit Murphy Middle School students getting ready to seed



Detroit Murphy Middle School students seeding



Murphy Middle School students seeding



Detroit Murphy Middle School student seeding crew

2.1.4 VISUAL INSPECTION AND FOLLOW-UP ACTIVITIES AT ELIZA HOWELL PARK AND ROUGE PARK

Monitoring of the sites occurred monthly from June through September of 2012. Given that this was done during the first growing season, as expected, the cover crop (annual rye and seed oats) was the dominant vegetation. Both sites had excellent coverage with little to no bare ground. Native species occurring at both seeding areas include black-eyed Susans (*Rudbeckia hirta*), wild bergamot (*Monarda fistulosa*), butterfly weed (*Asclepias tuberosa*) and yellow coneflower (*Ratibida pinnata*). Additional species are expected to be present as the seeding area matures.

With the assistance of local residents, maintenance has been conducted by Greening of Detroit at Eliza Howell Park and Friends of the Rouge at Rouge Park.

2.1.4.1 Rouge Park Site Assessment and Follow-up Activities

With the assistance of local residents, maintenance has been conducted by Friends of the Rouge at Rouge Park. During Rouge Rescue at Rouge Park on June 2, 2012, eight volunteers, two certified pesticide applicators from the City of Detroit and four staff from Greening of Detroit removed woody shrubs from the southern burn area and the southern end of the northern burn area, removing 15 square yards of material from about 1000 sq ft. Students from Detroit Neinas and Detroit Priest schools, overseen by the Southfield 4H Club seeded two acres of the southern end of the southern burn area with seed collected from Rouge Park in 2010. The photos on the following pages show some of the site assessment and follow-up activities at Rouge Park.

Rouge Park Site Assessment and Follow-up Activities- June 2, 2012



Students from Detroit Neinas and Detroit Priest schools visit to see progress



Rouge rescue event



Coreopsis and lupine

Rouge Park Site Assessment and Follow-up Activities- June 2, 2012 Continued



Native grasses



Native grasses

On June 13, 2012, in Rouge Park two certified pesticide applicators from the City of Detroit treated about one acre of the northern end of the burned area in Rouge Park that was heavily infested with Canada Thistle. They used backpack sprayers and a blend of 20% Garlon 4 Ultra, 2% Milestone, 78% HyGrade EC provided by ITC. The thistle responded well and had about an 80% mortality rate.



Certified pesticide applicators spraying Canadian thistle in the north burn area

On June 27, 2012, in Rouge Park 21 Boy Scouts and volunteers used 25 sling blades borrowed from the City of Detroit to chop off all the flowers on the Canadian Thistle in the remaining two acres of the southern burn area to prevent seed from being spread into the treated area.

Rouge Park Site Assessment and Follow-up Activities - June 27, 2012



Black Swallowtail on butterfly Milkweed in southern burn area



Scouts viewing the restored prairie



Scouts amidst the thistle they knocked down

On July 9, 2012 site assessment was done at Rouge Park by ARC Staff.

Rouge Park Site Assessment: July 9, 2012



Milkweed and monarda



Goldenrod and cup plant



Prairie grass

On July 11, 2012, in Rouge Park two Friends of the Rouge volunteers planted 17 rattlesnake master and 11 hoary vervain plants in the northern end of the southern burn unit that had been treated with herbicide and thistle was dead. Plants were purchased by FOTR for Rouge Rescue through a grant from REI.



Big blue stem



Big Blue stem and goldenrod

ROUGE PARK BEFORE AND AFTER PHOTOS



Rouge Park 10/27/10



Rouge Park 7/10/13

2.1.4.2 Eliza Howell Park Site Assessment and Follow-up Activities

With the assistance of local residents, maintenance has been conducted by Greening of Detroit at Eliza Howell Park. Site assessments were done at Eliza Howell Park in June, July, August and September of 2012. The following photos document these site assessments.

Eliza Howell Park Site Assessment: June 12, 2012





Penstemon, monarda and black-eyed Susan



Eliza Howell Park Site Assessment: August 17, 2012



Eliza Howell Park Site Assessment: September 26, 2012



ELIZA HOWELL PARK BEFORE AND AFTER PHOTOS



Eliza Howell 10/27/10



Eliza Howell 7/10/13

2.2 WAYNE COUNTY PARKS: LOWER ROUGE PARKWAY (VENOY AND INKSTER SITES) AND LOLA VALLEY PARK

The *Transforming the Rouge* project restored riparian corridor, wetlands, and upland habitat in the Rouge River Watershed to advance the removal of the benthos BUI ultimately leading to the removal of the Fish and Wildlife Habitat and Population BUIs. The Project continued the measurable progress shown on the Rouge River as documented in improvement in flooding statistics (decreased peak floods), increases in dissolved oxygen and increases in diversity of benthos. The Rouge River Watershed has been the focus of restoration efforts by local government and a variety of stakeholder and stewardship groups. This project united these past efforts to reduce areas of mowed turf grass by installing grow zones and prairie in local parks. The project created or restored approximately 36.5 acres of grow zones and restored about seven acres of wetlands within the Rouge River Watershed. This was accomplished through the restoration of six different sites located throughout the watershed.

Wayne County is the single largest riparian corridor landowner in the Rouge River AOC watershed (approximately 4,200 acres of riparian corridor) and has spent hundreds of millions of dollars over the last 20 years to help restore the river. Prior to *Transforming the Rouge*, the county's focus has been installing green infrastructure grow zone projects that are re-establishing a more natural/native landscape within the County's parklands. With support from the State of Michigan's Clean Michigan Initiative (CMI), Wayne County successfully converted 25 acres of turf grass into grow zones throughout the Middle Branch of the Rouge River. This project focused on two riparian corridors – The Lower Rouge River and the Upper Rouge River.

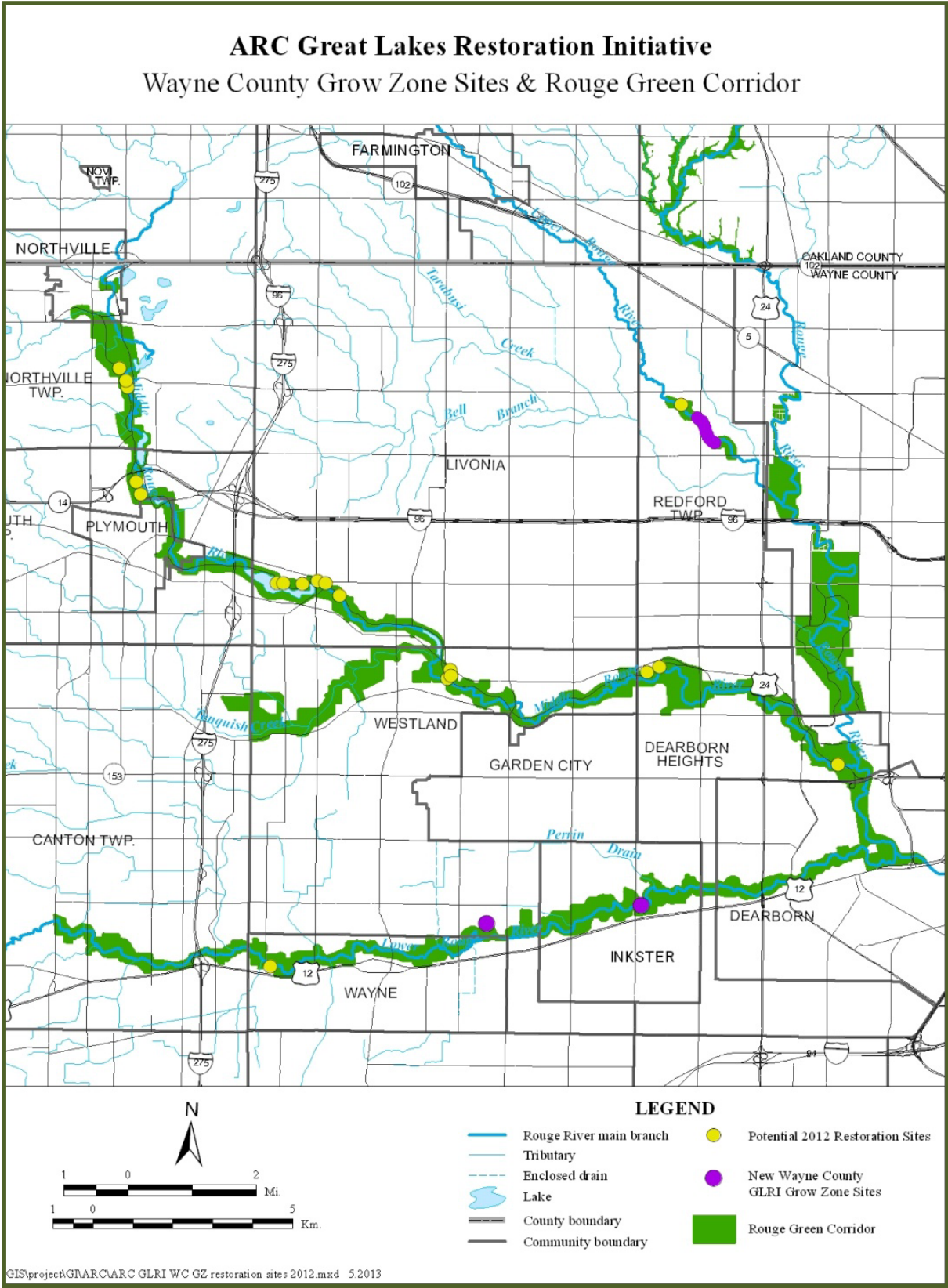
Lola Valley Park is within the Upper Rouge subwatershed and has approximately 1.5 miles of the Upper Rouge River flowing through the 58 acres of riparian parkland owned by Wayne County. According to the *Rouge AOC Delisting Document* the Upper Rouge Subwatershed's Bell Branch, which is downstream of Lola Valley Park, is known for its high gradient characteristic, which could potentially support a wide range of fish and aquatic organism communities due to the regular riffle-pool sequences; however, it also experiences significant flow variability that inhibits establishment of a diverse aquatic community (Catalfio et al, 2006). Lola Valley Park is completely within Redford Township and winds through a residential neighborhood. The park is approximately one-half mile upstream from the City of Detroit's Eliza Howell Park (another *Transforming the Rouge* project site.) For this project, Wayne County converted 8.8 acres of mowed turf into native plant grow zone in Lola Valley Park immediately adjacent to the Upper Rouge River.

The Lower Rouge River Subwatershed is heavily developed, however it still retains a moderately intact riparian corridor in the cities of Wayne, Inkster and Dearborn. The Lower Rouge Parkway is nearly 1200 acres of riparian public lands beginning in the City of Dearborn at the downstream end of the Rouge River and extending to Canton Township at the upstream end. Approximately 15 miles of the Lower Rouge River flows through the Lower Rouge Parkway. This riparian corridor is seasonally flooded, providing an important connection with the river. This dynamic is readily observed in the vicinity of the Inkster Valley Wetlands. This area is also important as it demonstrates the use of natural and constructed wetlands to treat non-point source pollution. The Lower Rouge at Goudy Park in the City of Wayne contains a diverse assemblage of aquatic macroinvertebrates including sensitive species. This project converted 6.6 acres of turf grass to native plant grow zones at the Lower Rouge sites at Venoy and the Inkster Basin.

This section summarizes the *Transforming the Rouge* restoration project sites implemented by Wayne County Department of Public Services.

Figure 2-5 illustrates the location of Wayne County's project sites both the newly constructed and the potential restoration sites.

Figure 2-5: Wayne County's Project Sites

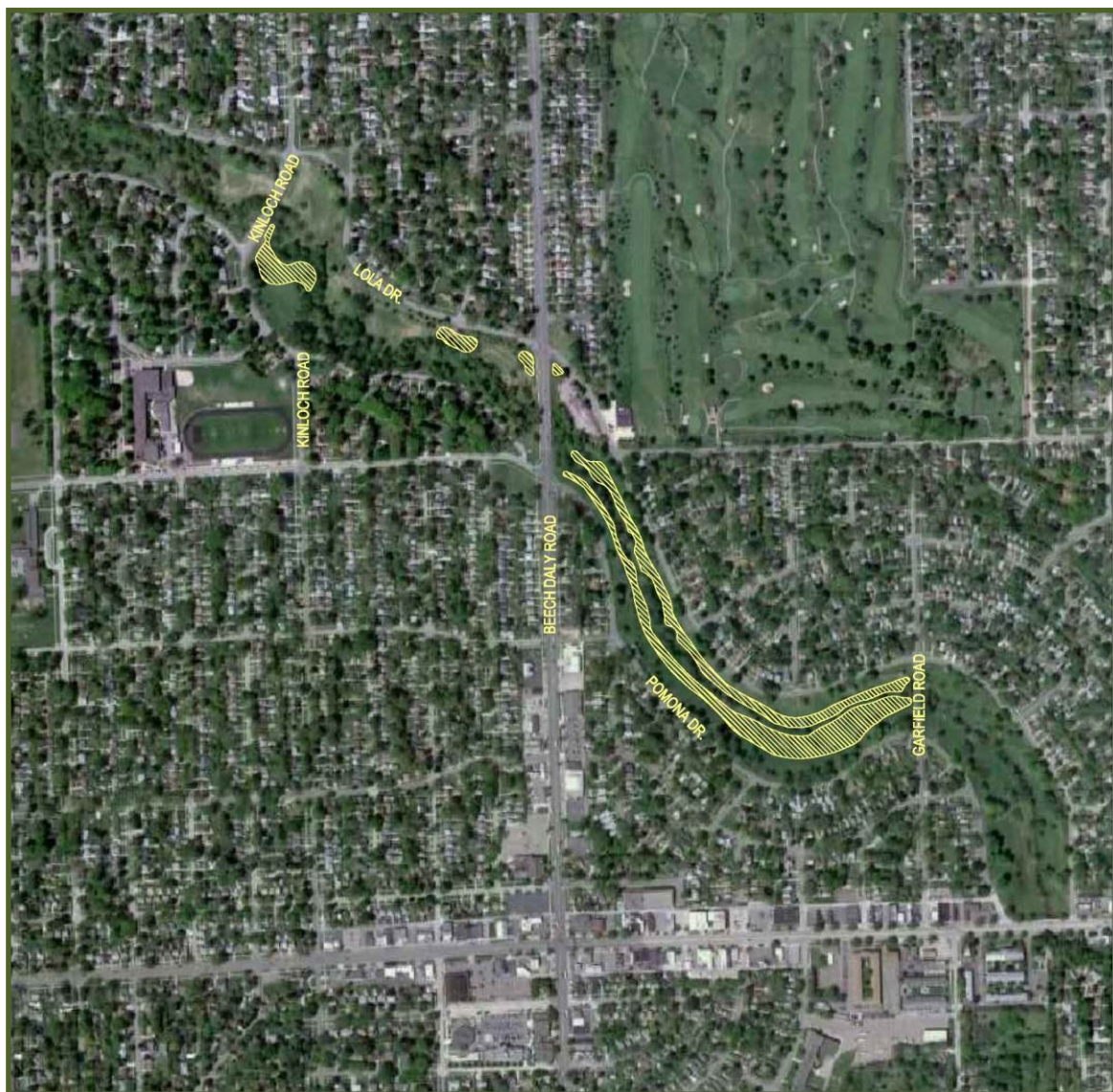


2.2.1 LOLA VALLEY PARK GROW ZONE

Lola Valley Park is within the Upper Rouge subwatershed and has approximately 1.5 miles of the Upper Rouge River flowing through 58 acres of riparian parkland owned by Wayne County. Lola Valley Park is completely within Redford Township and winds through a residential neighborhood, ending approximately one-half mile upstream of the City of Detroit's Eliza Howell Park, the site of another project funded by this grant. The Lola Valley Park project converted 8.8 acres of riparian turf grass to native plant grow zone.

Site investigation and reconnaissance of the park was conducted to take photographs and assess the proposed seeding areas on November 11, 2010. Aerial photographs and computer-aided design software was used to complete the design and layout of the seeding areas in January, 2011. Figure 2-6 shows the aerial of the Lola Valley Park project area.

Figure 2-6: Lola Valley Park Aerial



 - Project Areas

LOLA VALLEY PARK



Lola Valley Park before construction, November 11, 2010



Lola Valley Park before construction, November 11, 2010

The Lola Valley Park design which was included in the bid package is available at the end of this section as Attachment B.

Final construction contract plans and specifications which included general design standards, construction cost estimate, and type and quantity of plants were finalized in May, 2011. Wayne County procured a seeding contractor in August, 2011 and a pre-construction meeting was held on September 28, 2011.

The Lola Valley site was originally planted and seeded in June of 2012. Unfortunately, due to unavoidable circumstances, the summer of 2012 was extremely dry and the grow zone did not fully establish. The site was re-seeded in November 2012. A site assessment performed in May 2013 revealed that the cover crop had germinated and was about six inches tall. Some native species (black-eyed Susan, monarda, yellow coneflower) were present. Overall native plant germination was sporadic. The contractor, Michigan Wildflower Farm, will be performing invasive species removal, weeding and other maintenance activities as outlined in the sub-contract with Wayne County. Follow-up by Wayne County is being conducted as a part of the agreement with the contractor performing the work including, as necessary, re-seeding, in patchy or bare areas, will be required prior to final acceptance of these sites by Wayne County.

Most of the grow zone area (8.3 acres) was seeded with wet to mesic seed mix. Several small areas, up out of the floodplain and visible from Beech Daly Road, were planted with one-quart potted native plants including yellow and purple coneflower, wild bergamot and black-eyed Susan and seeded with a prairie seed mix (0.5 acres). Attachment B at the end of this section shows the detailed planting plans and specifications. Figure 2-6 on page 2-27 illustrates the location and extent of the grow zone. The following pages show pictures of the project construction and site conditions.



Lola Valley Park before construction, November 11, 2010

LOLA VALLEY SITE PREPARATION & CONSTRUCTION



Lola Valley Park November 15, 2011



Silt fence installed at Lola Valley Park November 15, 2011



Seeding at Lola Valley Park June 8, 2012



Seeding at Lola Valley Park June 8, 2012

LOLA VALLEY SITE ASSESSMENT

Summer 2012



Summer 2012 Continued



Fall 2012



Fall 2012 Continued



Spring 2013



Spring 2013 Continued



LOLA VALLEY BEFORE AND AFTER PHOTOS



Lola Valley 11/11/10



Lola Valley 7/10/13

2.2.2 VENOY PARK & INKSTER CSO BASIN GROW ZONE SITES

The Lower Rouge Parkway is nearly 1,200 acres of riparian public lands managed by Wayne County Parks which begins in the City of Dearborn at the downstream end of the Lower Rouge River and extends to Canton Township at the upstream end. Approximately, 15 miles of the Lower Rouge River flows through the Lower Rouge Parkway. Through this grant project 6.6 acres of turf grass was converted to native plant grow zone at Venoy Park (4.0 acres) and adjacent to the Inkster CSO basin (2.6 acres). These grow zones were planted in the fall of 2011 and established in the summer of 2012. A site assessment performed in May 2013 revealed that these sites are generally developing well with an abundance of native species (black-eyed Susan, yellow coneflower, monarda, etc.). Each site has some issues with invasive species and fairly thin native plant coverage in areas. The contractor, Michigan Wildflower Farm, will be performing invasive species removal, weeding and other maintenance activities as outlined in the sub-contract with Wayne County. Follow-up by Wayne County is being conducted as a part of the agreement with the contractor performing the work including, as necessary, re-seeding, in patchy or bare areas, will be required prior to final acceptance of these sites by Wayne County.

The Venoy Park and Inkster CSO Basin site designs are included in a bid package that is Attachment B.

All of the Venoy Park and Inkster CSO Basin grow zone areas were seeded with a prairie seed mix. Detailed planting plans and specifications are included at the end of this section as Attachment B. Figure 2-7 illustrates the location and extent of the Venoy Park Grow Zone. The pictures illustrate project construction and site conditions of the Venoy Park Grow Zone.

Figure 2-7: Venoy Park Aerial



 - Project Areas



Venoy Park before construction, November, 2010



Venoy Park before construction, November, 2010

VENOY PARK SITE PREPARATION & CONSTRUCTION – November 17, 2011



VENOY PARK SITE ASSESSMENT

Summer 2012





Fall 2012



Spring 2013



Spring 2013 Continued



VENOY PARK BEFORE AND AFTER PHOTOS



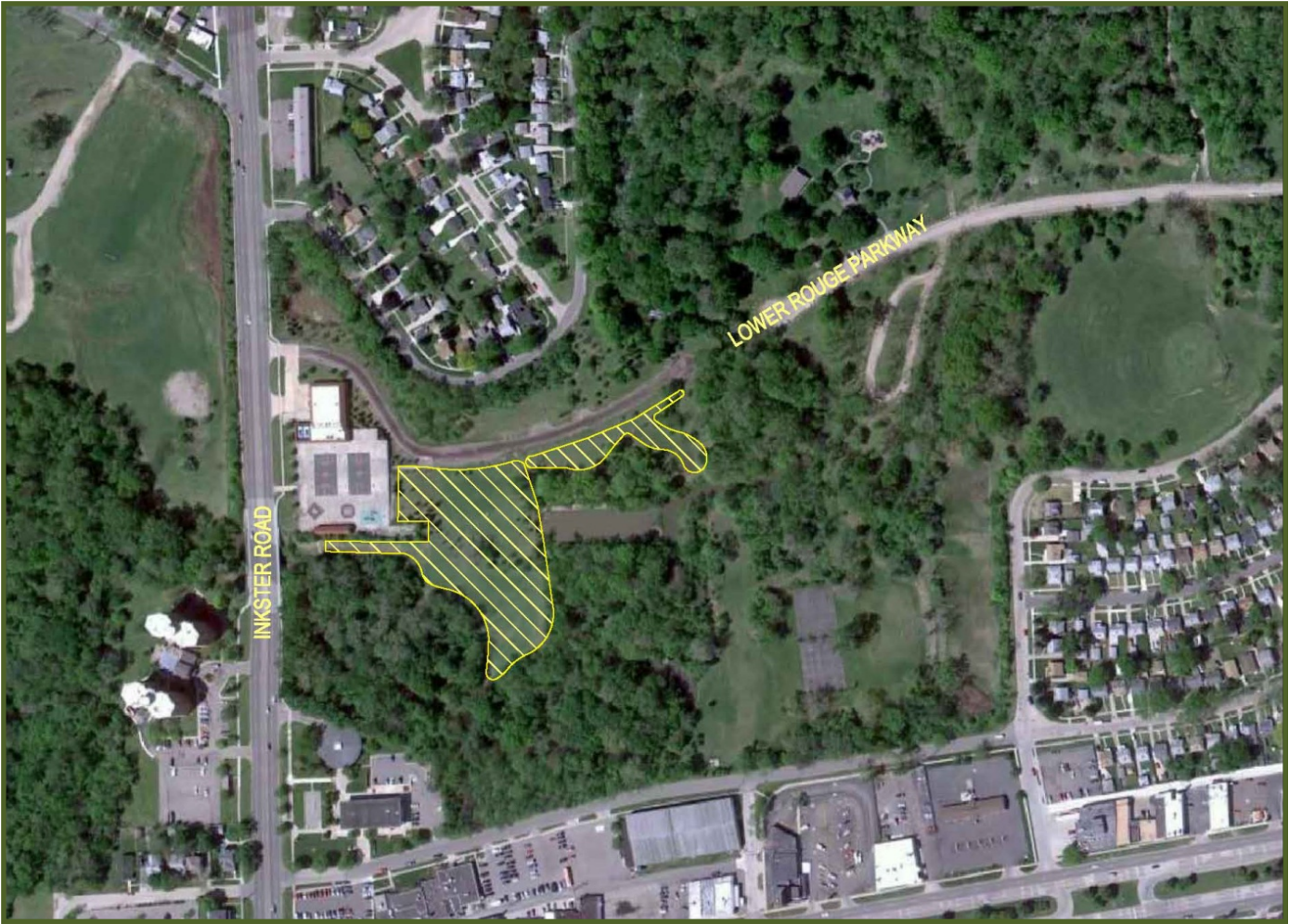
Venoy Park 11/17/10



Venoy Park 7/10/13

The location and extent of the Inkster CSO Basin Grow Zone is shown in Figure 2-8. The photos show the project construction and site conditions of the Inkster CSO Basin Grow Zone.

Figure 2-8: Inkster CSO Basin Site Aerial



 - Project Areas



Inkster CSO Basin Site before construction, November, 2010



Inkster CSO Basin Site before construction, November 2010

INKSTER CSO BASIN SITE PREPARATION & CONSTRUCTION – November, 2011



INKSTER CSO BASIN SITE PREPARATION & CONSTRUCTION CONTINUED – November 2011



INKSTER CSO BASIN SITE ASSESSMENT

Summer 2012



Summer 2012 Continued



Fall 2012





Spring 2013



Spring 2013 Continued



INKSTER CSO BASIN BEFORE AND AFTER PHOTOS



Inkster CSO Basin 11/17/10



Inkster CSO Basin 7/10/13

2.2.3 WAYNE COUNTY ROUGE RIVER GROW ZONE RESTORATION

Through an amendment to the grant, Wayne County was able to restore an additional (approximately) 10 acres of existing grow zone on Wayne County Parks property within the Rouge River AOC. Wayne County contracted with Niswander Environmental in May 2012 to assess conditions at the old Wayne County Grow Zone sites within the Upper, Middle and Lower branches of the Rouge River. Niswander also prepared a short-term (2012) restoration strategy and implemented restoration activities on 11.1 acres at 13 sites within Hines Park along the Middle Rouge River (see Figure 2-9). Table 2-1 identifies the specific project sites, restoration method (prescribed burn or herbicide) and acreage involved. A copy of the Wayne County Grow Zone Restoration 2012 and long term maintenance strategy report prepared by Niswander Environmental is included at the end of this section as Attachment C.

Figure 2-9: Wayne County's Grow Zone Restoration Sites

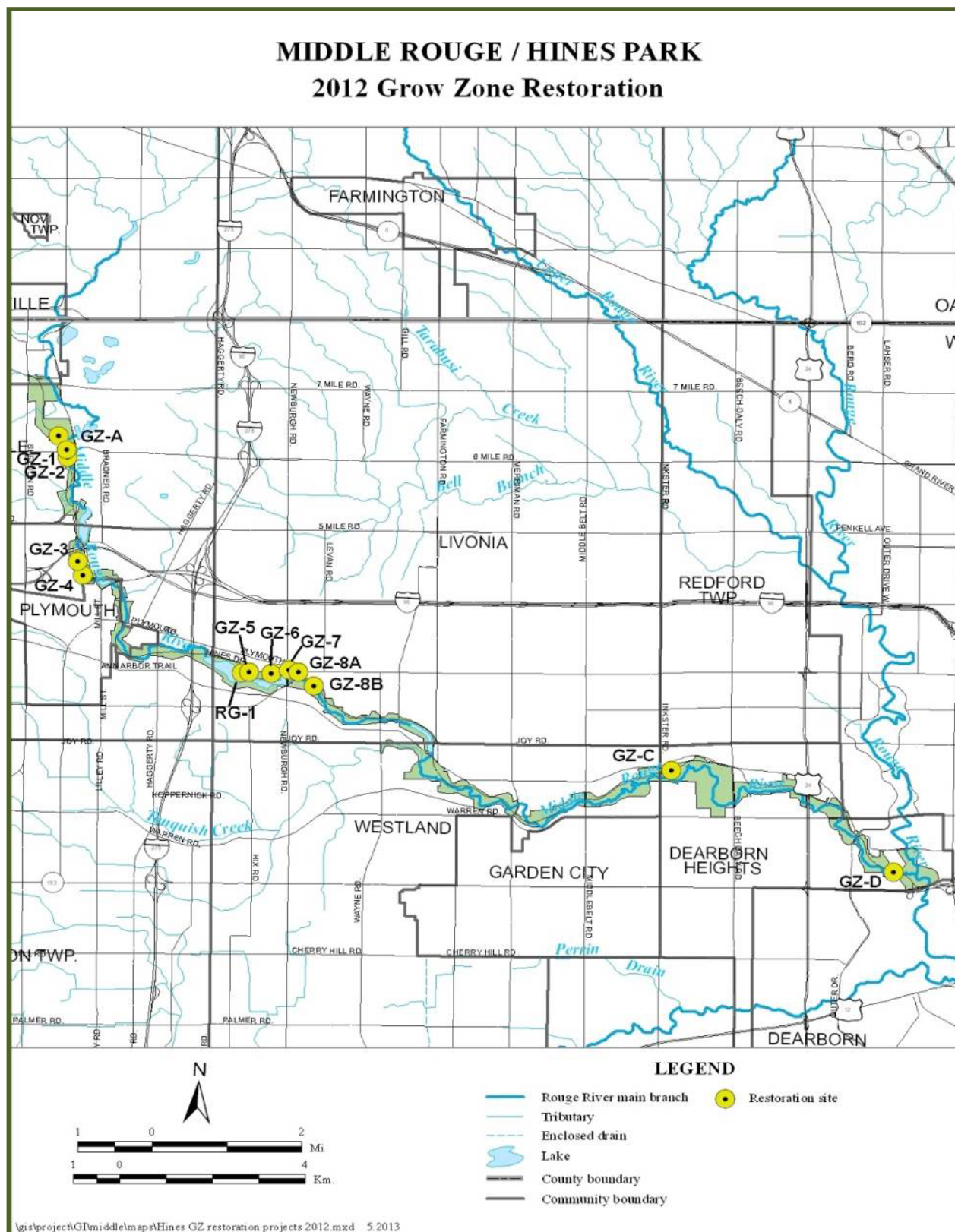


Table2-1: Grow Zone Restoration Sites, Methods & Area

2012 GROW ZONE RESTORATION SITES	AREA (ACRES)	RESTORED (ACRES)
Middle Rouge Grow Zones		
GZ A – Bennett*	2	1.8
GZ C – Inkster Rd.	2	1.6
GZ D – Ford Rd.	5	1.13
GZ 1 – Waterford Bend	1	0.6
GZ 2 – Six Mile	1	0.8
GZ 3 – Spring Hill	1	0.6
GZ 4 – Parkview	1	0.3
GZ 5 – Newburgh Pointe	0.5	0.5
GZ 6 – Sumac Pointe	2	1.1
GZ 7 – Newburgh Dam	1	0.63
GZ 8a – Plymouth & Ann Arbor Rd.	1	1.26
GZ 8b – Levan Knoll	1	0.38
RG 1 – Newburgh Pointe	1	0.2

*An additional 0/2 acres of this site was restored using herbicide

Prescribed Burn – 7.54 total acres
 Herbicide – 3.56 total acres
Total to be restored – 11.1 acres

The below photos provide a pictorial summary of the prescribed burns performed to restore the Hines Park grow zones.

GROW ZONE RESTORATION PRESCRIBED BURNS – October & November 2012



GZ A – Bennett Arboretum



GZ C – Inkster Road



GZ 1 – Waterford Bend



GZ 2 – Six Mile Road



GZ 6 – Sumac Pointe



GZ 8a – Plymouth & Ann Arbor Road



GZ 8b – Levan Knoll

Burn Plan**Site:** Rouge Park**On Site Cell Phone** (734) 649-4367**Location:** Wayne Co., City of Detroit T.2S R.10E, Section 4 (NE)**Fire Control Access:** Along Outer Dr (at Tireman) or from Parkland (at Belton)**Nearest Water Source:** Portable pump for drawing water from Rouge River (runs along Outer Dr adjacent to burn units)**Nearest Fire Hydrants:** Along Parkland at Dacosta, Lamphere, Belton, Constance, and Beaverland; on Outer Dr at north end of southern burn unit.**Ownership:** City of Detroit**Prescribed Burn Leader:** David Mindell (PlantWise, LLC)**Fire Jurisdiction:** City of Detroit Fire Department

Emergency assistance: 911**Other Numbers:**

Detroit Captain Steven Hurst 313-743-8548

Detroit Police: 313 596-5900

Site Description: Two units containing prairie and old field vegetation. Northern unit contains shrub growth along west edge.**Total acreage:** two units totalling 7 acres**Slope & Aspect:** Flat.**Fuels surround unit:** Prairie to north; mowed turf to east and west; old field to south.**Burn Objective:** Eliminate invasive vegetation to allow re-growth of native prairie plant species.**Fire Sensitive Animal Species of Concern:**

<u>Scientific name</u>	<u>Common name</u>	<u>State Rank</u>
None Known		

Window of opportunity to burn: Spring, late February through mid May.**Before burning notify:**_____ **Detroit Fire Department Dispatch** 313-596-1620_____ **Detroit Police (Western (?) District)** 313 596-****_____ **Detroit City Communications Department**-Chris Copicko 313-224-3758_____ **Recreation Department**- Keith Fournoy 313-475-4629_____ **MDEQ Land & Water Mngmt Division**-Maria (acting director) 586-753-1465

Agency / Organization	Phone Number/Email	Contact Person
Detroit Fire Department	313-743-8548	Detroit Captain Steven Hurst
Detroit Communications Dept	313-224-9277	Karen Dumas
Michigan DEQ – Detroit Field Office	313-456-4683, 313-456-4685 LAMBJ1@michigan.gov MCLEMOREW@michigan.gov	Jon Lamb Wilhemina McLemore
DFD Firefighter Ops	313-596-2921	Chief Steven Flanigan
DPD Deputy Chief	313-596-2006	Herbert Moreland – DC

Weather, fuel, and fire behavior parameters:

	<u>Minimum</u>	<u>Maximum</u>	<u>Preferred</u>
Temperature (°F)	35	75	60
Relative humidity (%)	30	50	35
Wind speed (mph) (reported 20')	5	25	10-15
(on site midflame)	1	10	4-6
Wind direction (degree)	280	320	290-315 (NW)
Mixing Height (meters)			>500
Transport Winds (mph)			>9

Desired fire behavior:

Fire will back burn off downwind breaks widening these breaks. As backing fire continues creeping into the wind, flanking fires will extend breaks along both sides of unit to prevent fire from running at unsecured break. Flanking fires may be brought around to upwind side to encircle unit.

Desired flame length: 3-10 feet

Desired rate of spread: 15-60 chains/hour

Spotting potential:

Medium to low. Dominant fuel is herbaceous grass litter. Prairie vegetation continues north beyond northern unit, but NW winds will keep spotting inside unit here. Old field vegetation south of southern unit is dominated by cool season grasses.

Site preparation plans:

Burn breaks will be mowed at north edge of northern unit. All other burn breaks are delineated by mowed paths/two-tracks. Immediately before the burn, crew will walk the site both to familiarize themselves with the unit that day. If dead trees are located at west edge of north unit, leaf litter will be raked from under fuels.

Firing technique and ignition pattern:

This burn will be ignited as a backburn. The point of ignition will be on the farthest downwind edge of each unit. Flank and head fires may be used once downwind breaks are secured.

Mop-up plan: Mop up will be 100%.

Fire sensitive areas/hazards:

- None known

Smoke Management Plan: The following steps will be taken to minimize smoke and its negative impacts:

1. The neighbors immediately adjacent to the burn units will be notified on the day of the planned burn.
2. Burn will be conducted on a day when atmospheric conditions allow for adequate lifting and dispersion of smoke.
3. Significant portions of the burn will be conducted as a “back burn,” which will keep flame lengths low but achieve the most complete combustion of the fuel, thus minimizing the smoke output.
4. Wind direction will carry smoke away from residential areas along Parkland St.
5. Roadside signs will be placed to make passersby aware of prescribed burn.

Wildfire Contingency Plan:

In the unlikely event that the prescribed burn jumps the established breaks, the following actions will be implemented: If a wildfire occurs on the site, the goal will be to confine the fire to the site by using predetermined breaks and securing these breaks. The burn leader will assess the jump location, fire's rate of movement, danger to crew members, etc, and determine whether backup assistance is warranted. If the burn moves beyond the designated breaks, the burn leader will determine locations and actions to contain the escape within the secondary/contingency area.

Truck and ATV with water tanks will be stationed close to each burn unit.

Containment actions may include using brush cutter lines to create new breaks, relocating water support, initiating backing fire(s) from new break sites outside the original unit.

If the burn escapes beyond these secondary breaks burn leader will dial 911 and turn over command.

Once the wildfire is contained, notification of the appropriate parties will take place.

Plan prepared by: David Mindell

Date: 1/26/12





Burn Plan

Site: Eliza Howell Park
4367

On Site Cell Phone (734) 649-

Location: Wayne Co., City of Detroit **T.1S R.10E, Section 21 (SW)**

Fire Control Access: South end of Park Loop Rd (off Fenkell)

Nearest Water Source: Portable pump for drawing water from Rouge River (south edge of burn units)

Nearest Fire Hydrants: Fenkell St at Park Rd and immediately across from burn units.

Ownership: City of Detroit

Prescribed Burn Leader: David Mindell (PlantWise, LLC)

Fire Jurisdiction: City of Detroit Fire Department

Emergency assistance: 911

Other Numbers:

Detroit Captain Steven Hurst 313743-8548

Detroit Police: 313 596-5900

Site Description: Two units containing prairie and old field vegetation.

Total acreage: two units totalling 5 acres

Slope & Aspect: Flat.

Fuels surround unit: Oak woods surround units to west, south, and east.

Burn Objective: Eliminate invasive vegetation to allow growth of native prairie plant species.

Fire Sensitive Animal Species of Concern:

Scientific name

Common name

State Rank

None Known

Window of opportunity to burn: Spring, late February through mid May.

Before burning notify:

_____ **Detroit Fire Department Dispatch** 313-596-1620

_____ **Detroit Police (Western (?) District)** 313 596-****

_____ **Detroit City Communications Department**-Chris Copicko 313-224-3758

_____ **Recreation Department**-Keith Fournoy 313-475-4629

_____ **MDEQ Land & Water Mngmt Division**-Maria (acting director) 586-753-1465

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(on site midflame)	1	10	4-6
Wind direction (degree)	180	350	280-350 (NW)
Mixing Height (meters)			>500
Transport Winds (mph)			>9

Desired fire behavior:

Fire will back burn off downwind breaks widening these breaks. As backing fire continues creeping into the wind, flanking fires will extend breaks along both sides of unit to prevent fire from running at unsecured break. Flanking fires may be brought around to upwind side to encircle unit.

Desired flame length: 1-2 feet

Desired rate of spread: 15-50 chains/hour

Spotting potential:

Medium to low. Dominant fuel is herbaceous grass litter. Both units have been mowed, greatly reducing spotting potential. Woodland fuels south of unit have potential to burn and will be wet down prior to ignition.

Site preparation plans:

Leaf blower will be used to blow leaf litter from edge of woods.

Firing technique and ignition pattern:

This burn will be ignited as a backburn. The point of ignition will be on the farthest downwind edge of each unit. Flank and head fires may be used once downwind breaks are secured.

Mop-up plan: Mop up will be 100%.

Fire sensitive areas/hazards:

- Gazebo in eastern unit (sits on concrete pad)

Smoke Management Plan: The following steps will be taken to minimize smoke and its negative impacts:

1. The neighbors immediately adjacent to the burn units will be notified on the day of the planned burn.
2. Burn will be conducted on a day when atmospheric conditions allow for adequate lifting and dispersion of smoke.
3. Significant portions of the burn will be conducted as a “back burn,” which will keep flame lengths low but achieve the most complete combustion of the fuel, thus minimizing the smoke output.
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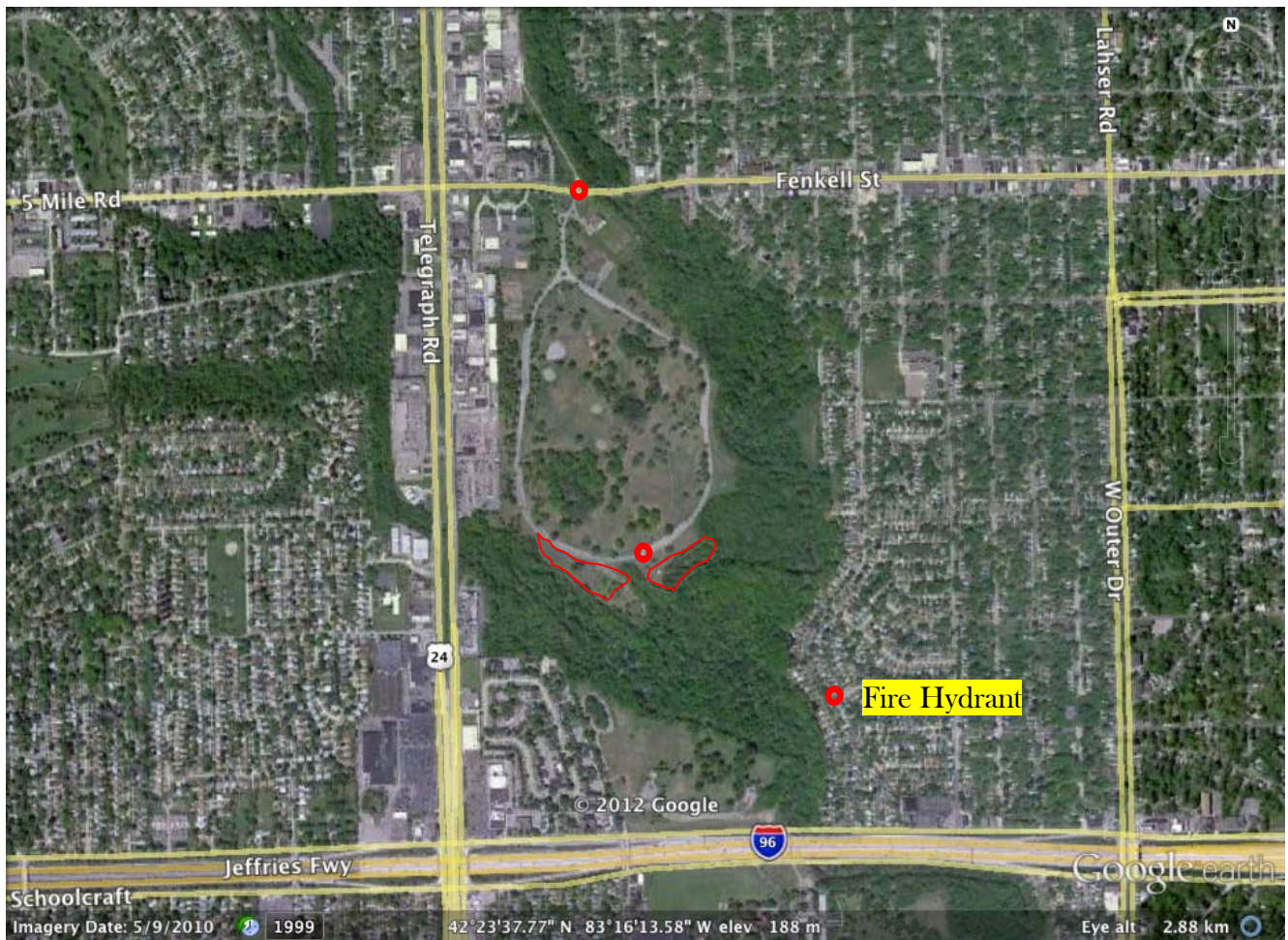
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Plan prepared by: David Mindell

Date: 1/26/12





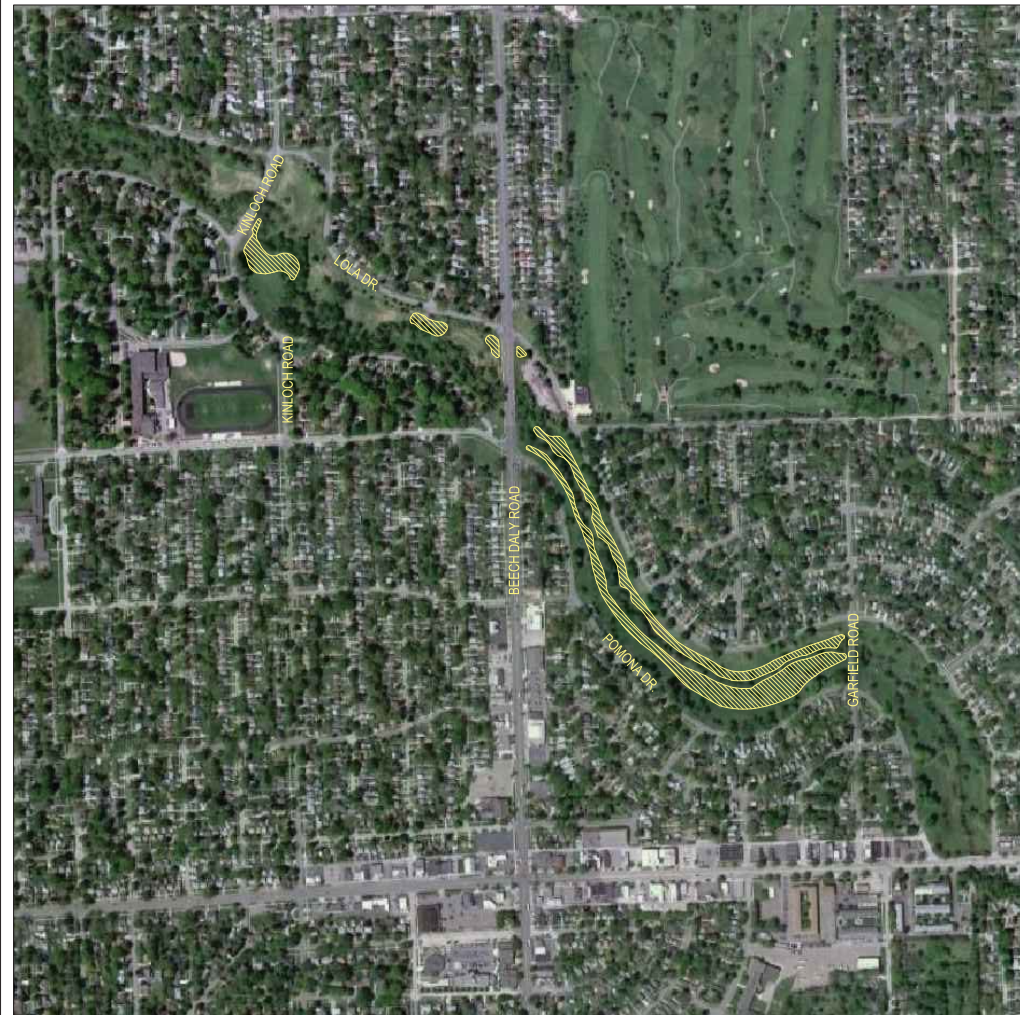
Rouge River

TRANSFORMING THE ROUGE AOC FROM MOWED DOWN TO GROWN UP

UPPER AND LOWER ROUGE PARKWAY

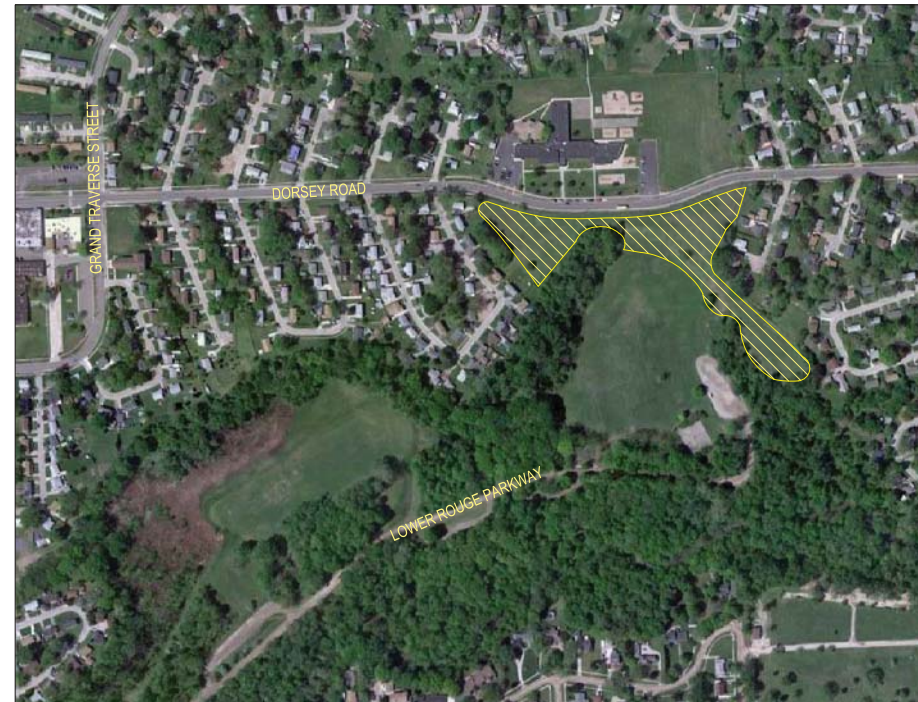
ATTACHMENT B

U.S. EPA REGION 5, GREAT LAKES NATIONAL PROGRAM OFFICE GRANT # GL-00E00639-0
CHARTER COUNTY OF WAYNE - CONTROL # 37-11-180
JUNE 2011



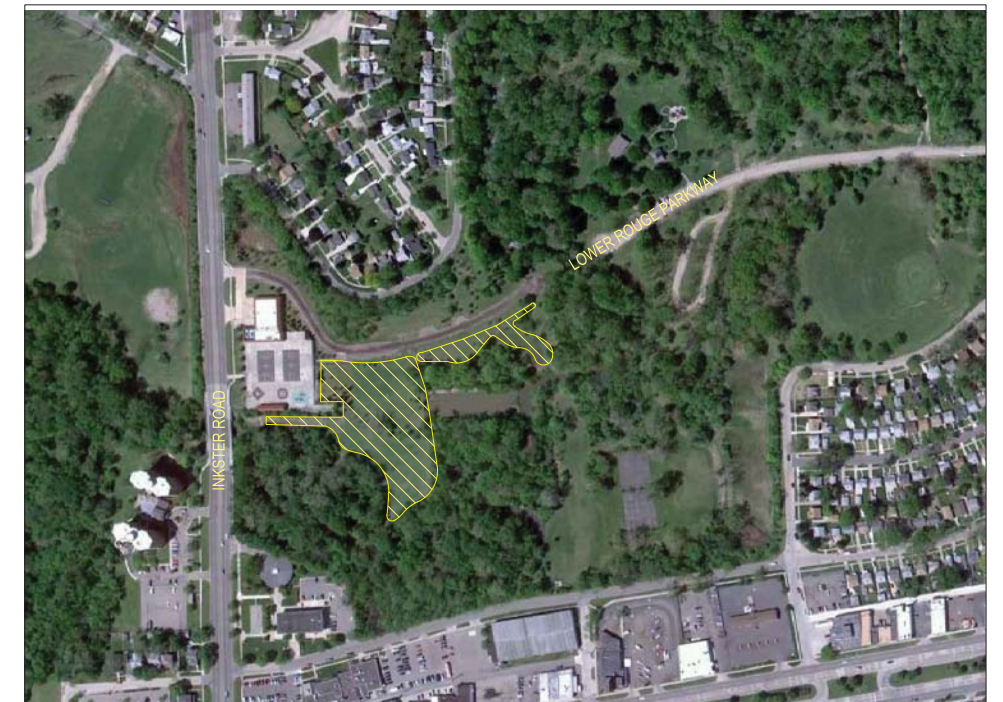
LOLA VALLEY - REDFORD TOWNSHIP, MICHIGAN

NOT TO SCALE



VENOY PARK - WESTLAND, MICHIGAN

NOT TO SCALE



INKSTER CSO - INKSTER, MICHIGAN

NOT TO SCALE



LOCATION MAP



WAYNE COUNTY

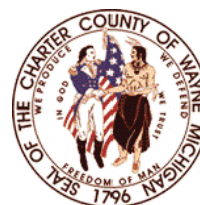
DRAWING INDEX

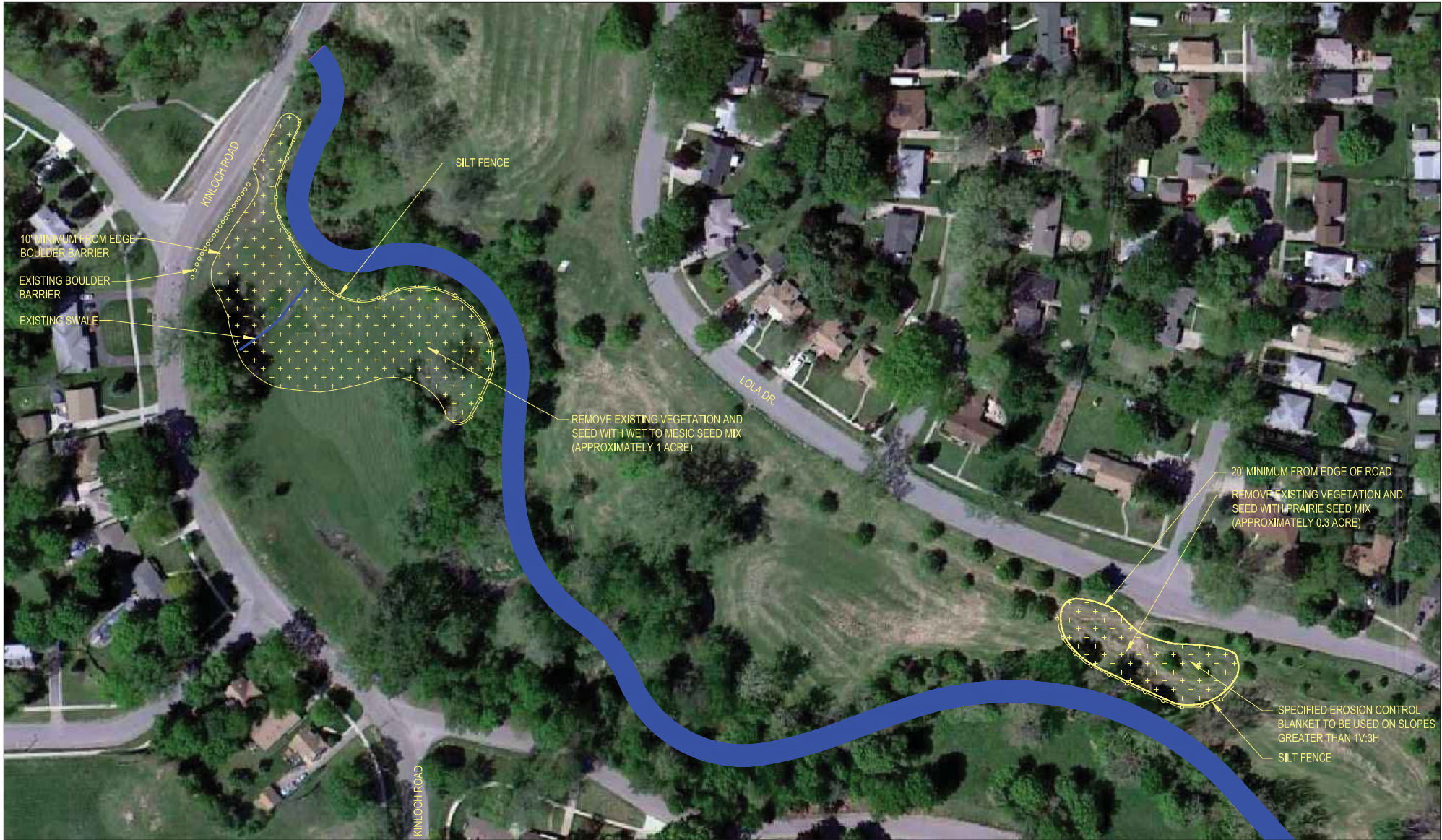
- COVER SHEET
- 1 LOLA VALLEY NATIVE PLANTING AREA 1
- 2 LOLA VALLEY NATIVE PLANTING AREA 2
- 3 LOLA VALLEY NATIVE PLANTING AREA 3
- 4 VENOY PARK NATIVE PLANTING
- 5 INKSTER CSO NATIVE PLANTING



FUNDING:

THIS PROJECT WAS FUNDED IN PART BY ROUGE RIVER NATIONAL WET WEATHER DEMONSTRATION PROJECT (U.S. EPA GRANT #XP995743-09)





LOLA VALLEY PLANTING AREA 1

PRAIRIE SEED MIX (7.1 ACRES TOTAL)			WET TO MESIC SEED MIX (8.2 ACRES TOTAL)		
SCIENTIFIC NAME	COMMON NAME	LBS/AC	SCIENTIFIC NAME	COMMON NAME	LBS/AC
ALLIUM CERNUUM	NODDING WILD ONION	0.063	ANDROPOGON GERARDII	BIG BLUESTEM GRASS	3.000
AGROPYRON TRACHYCAULUM	SLENDER WHEAT GRASS	1.000	ASCLEPIAS INCARNATA	SWAMP MILKWEED	0.063
ANDROPOGON SCOPARIUS	LITTLE BLUESTEM	3.000	ASTER LAEVIS	SMOOTH BLUE ASTER	0.016
ASCLEPIAS TUBEROSA	BUTTERFLY WEED	0.094	ASTER NOVA-ANGLIAE	NEW ENGLAND ASTER	0.031
ASTER LAEVIS	SMOOTH BLUE ASTER	0.188	AVENA SATIVA	COMMON OAT	22.00
ASTER NOVA-ANGLIAE	NEW ENGLAND ASTER	0.125	CALAMAGROSTIS CANADENSIS	BLUE JOINT GRASS	0.063
AVENA SATIVA	COMMON OAT	22.00	CAREX ANNECTENS	YELLOW-FRUITED SEDGE	0.063
CAREX BICKNELLII	BICKNELL'S OVAL SEDGE	0.063	CAREX BEBBII	BEBB'S SEDGE	0.063
CASSIA FASCICULATA	PARTRIDGE PEA	0.398	CAREX NORMALIS	NORMAL SEDGE	0.063
COREOPSIS LANCEOLATA	SAND COREOPSIS	0.450	CAREX VULPINOIDEA	FOX SEDGE	0.125
COREOPSIS TRIPTERIS	TALL COREOPSIS	0.125	CASSIA FASCICULATA	PARTRIDGE PEA	0.250
ECHINACEA PURPUREA	PURPLE CONEFLOWER	0.830	ELYMUS CANADENSIS	CANADA WILD RYE	1.000
ELYMUS CANADENSIS	NODDING WILD RYE	1.000	ELYMUS VIRGINICUS	VIRGINIA WILD RYE	4.000
HELIOPSIS HELIANTHOIDES	EARLY SUNFLOWER	0.188	EPILOBIUM COLORATUM	CINNAMON WILLOW HERB	0.015
LESPEDEZA CAPITATA	ROUNDHEAD BUSHCLOVER	0.094	EUPATORIUM PERFOLIATUM	BONESET	0.015
LIATRIS ASPERA	ROUGH BLAZING STAR	0.125	HYPERICUM PYRAMIDATUM	GREAT ST. JOHN'S WORT	0.063
LOLIUM MULTIFLORUM	ANNUAL RYE	6.000	IRIS VIRGINICA	BLUEFLAG IRIS	0.125
LUPINUS PERENNIS	LUPINE	0.180	LIATRIS SPICATA	SPIKED BLAZING STAR	0.188
MONARDA FISTULOSA	BERGAMOT	0.063	LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	0.031
PENSTEMON DIGITALIS	FOXGLOVE BEARDTONGUE	0.125	LOLIUM MULTIFLORUM	ANNUAL RYE	6.000
PHYSOSTEGIA VIRGINIANA	FALSE DRAGONHEAD	0.031	MIMULUS RINGENS	MONKEY FLOWER	0.031
POTENTILLA ARGUTA	PRAIRIE CINQUEFOIL	0.063	MONARDA FISTULOSA	BERGAMOT	0.063
PYCNANTHEMUM VIRGINIANUM	COMMON MOUNTAIN MINT	0.125	PANICUM VIRGATUM	SWITCH GRASS	0.250
RATIBIDA PINNATA	YELLOW CONEFLOWER	0.500	PHYSOSTEGIA VIRGINIANA	SHOWY DRAGONHEAD	0.063
RUDBECKIA HIRTA	BLACK-EYED SUSAN	0.250	PYCNANTHEMUM VIRGINIANUM	MT. MINT	0.063
SILPHIUM TEREBINTHINACEUM	PRAIRIE DOCK	0.020	RATIBIDA PINNATA	YELLOW CONEFLOWER	0.250
SOLIDAGO GRAMINIFOLIA	GRASSLEAFED GOLDENROD	0.031	RUDBECKIA HIRTA	BLACK EYED SUSAN	0.250
SOLIDAGO NEMORALIS	OLD-FIELD GOLDENROD	0.125	SCIRPUS ATROVIRENS	DARK GREEN RUSH	0.500
SOLIDAGO RIDDELLII	RIDDELL'S GOLDENROD	0.094	SOLIDAGO RIDDELLII	RIDDELL'S GOLDENROD	0.063
SOLIDAGO RIGIDA	STIFF GOLDENROD	0.125	SOLIDAGO RIGIDA	RIGID GOLDENROD	0.125
SOLIDAGO SPECIOSA	SHOWY GOLDENROD	0.125	SORGHASTRUM NUTANS	INDIAN GRASS	4.000
VERBENA STRICTA	HOARY VERVAIN	0.250	SPARTINA PECTINATA	PRAIRIE CORD GRASS	0.188
VERNONIA MISSURICA	COMMON IRONWEED	0.125	VERNONIA FASCICULATA	COMMON IRONWEED	0.031
VERONICASTRUM VIRGINICUM	CULVER'S PHYSIC	0.010	VERONICASTRUM VIRGINICUM	CULVER'S PHYSIC	0.063
ZIZIA AUREA	GOLDEN ALEXANDER	0.063	ZIZIA AUREA	GOLDEN ALEXANDER	0.031
	TOTAL	38.048		TOTAL	43.145

IF CONTAINER STOCK IS ROOT BOUND, MAKE 4 VERTICAL CUTS IN EACH ROOT BALL WITH SHARP BLADE

INSTALL ALL PLANTS VERTICAL.

ROOT COLLAR SQUARE TO FINISH GRADE

MULCH

PROVIDE 3" SOIL SAUCER AROUND EACH PLANT

BACKFILL WITH EXCAVATED SITE SOIL & TAMP LIGHTLY

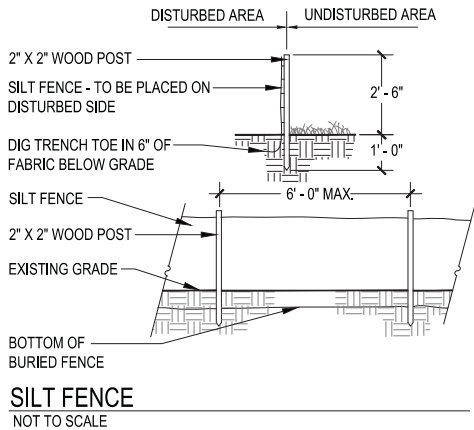
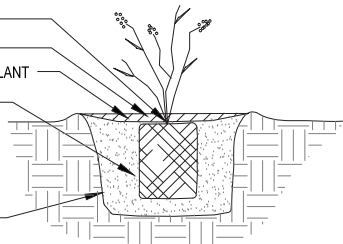
WATER TO SATURATE BACKFILL MATERIAL WITHIN 1 HOUR OF PLANTING

SCARIFY BOTTOM AND SIDEWALLS OF PLANTING PIT.

DO NOT FERTILIZE.

HERBACEOUS PLANTING DETAIL

NOT TO SCALE



LOLA VALLEY NATIVE PLANTING LOCATION

GENERAL NOTES:

1. THE LOLA VALLEY PROJECT IS LOCATED TO THE EAST AND WEST OF BEECH DALY ROAD WITHIN LOLA VALLEY PARK.
2. ALL EXISTING UTILITIES SHALL BE LOCATED PRIOR TO IMPLEMENTATION.
3. NO GRADE CHANGE IS PROPOSED.
4. ALL TRIBUTARIES, RIVERS, STREAMS, WETLANDS ETC. SHALL BE PROTECTED FROM THE DISCHARGE OF FLUIDS, SOILS OR MATERIALS.
5. ALL EXISTING TREES SHALL BE PROTECTED THROUGHOUT THE DURATION OF THE PROJECT.
6. REFER TO SPECIFICATION, SECTION 02950 LANDSCAPING FOR SITE PREPARATION, PLANTING, AND MAINTENANCE REQUIREMENTS.
7. SEED MIXES AND DETAILS FOR LOLA VALLEY, VENOU PARK AND THE INKSTER ROAD CSO PROJECT SITES ARE SHOWN ON SHEET 1.

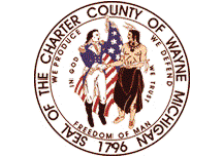
MAINTENANCE AND GUARANTEE:

1. THE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPING SPECIFIED HEREIN FOR ONE (1) YEAR FOLLOWING APPROVAL OF PRELIMINARY INSPECTION. THE CONTRACTOR SHALL RESPOND WITHIN TWO (2) WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT/REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
2. REFER TO SPECIFICATIONS, SECTION 02950 LANDSCAPING FOR MAINTENANCE REQUIREMENTS.



OURS TO PROTECT

Working together, restoring the river



Environmental Consulting & Technology, Inc.

2200 Commonwealth Blvd, Suite 500
Ann Arbor, Michigan 48105
734.768.3004
734.768.3164 fax
www.ectinc.com

UPPER ROUGE PARKWAY LOLA VALLEY

REDFORD TOWNSHIP,
WAYNE COUNTY, MICHIGAN

TRANSFORMING THE ROUGE AOC FROM MOWED DOWN TO GROWN UP

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

FOR BID	6-9-11
DRAFT	1-31-11
100918-0100	
ECT PROJECT NUMBER	
TSH DESIGNED BY	ZB CHECKED BY
TSH DRAWN BY	ZB APPROVED BY

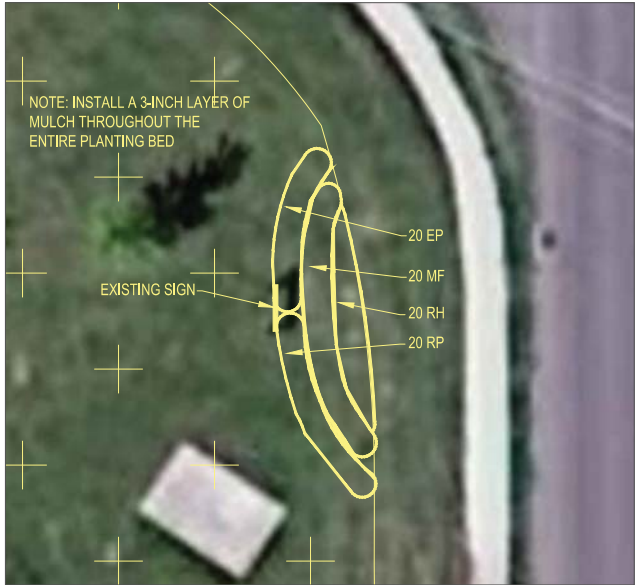
SHEET NAME

LOLA VALLEY
NATIVE PLANTING
AREA 1

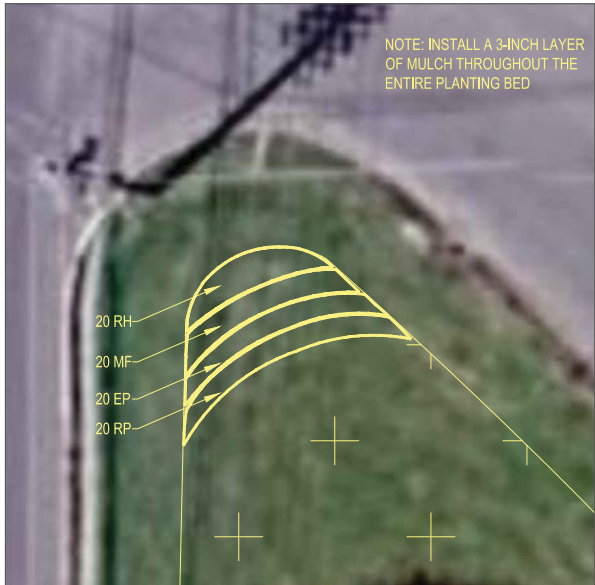
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LOLA VALLEY PLANTING AREA 2



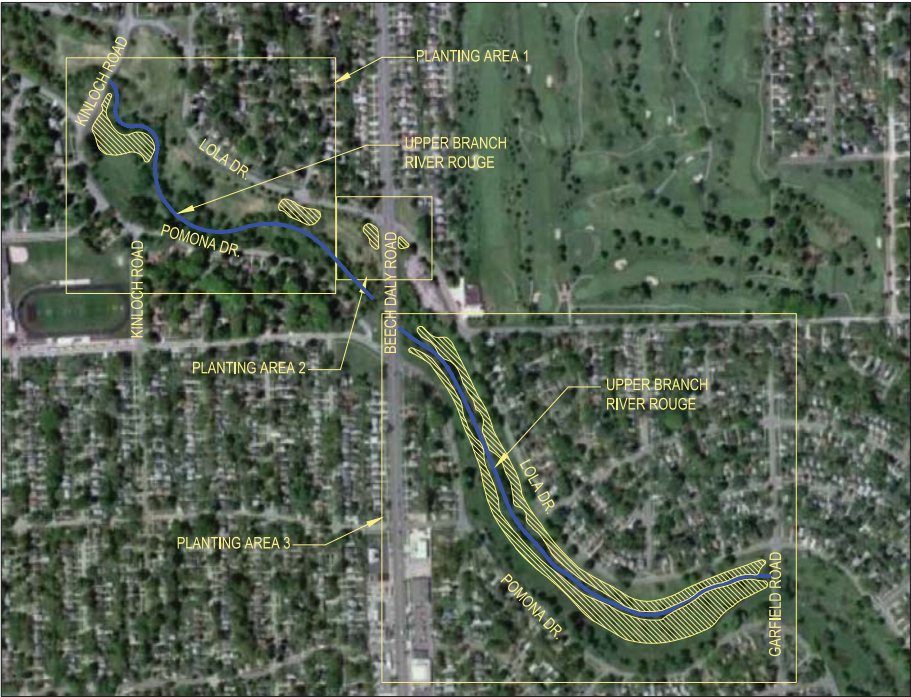
PLANTING DETAIL 2A (0.005 ACRES)



PLANTING DETAIL 2B (0.005 ACRES)

PLANTING AREA 2 PLANT LIST:

QTY	SYM	SCIENTIFIC NAME	COMMON NAME	SPACING	CONT
40	EP	ECHINACEA PURPUREA	PURPLE CONEFLOWER	18" O.C.	1 QT.
40	MF	MONARDA FISTULOSA	WILD BERGAMOT	18" O.C.	1 QT.
40	RH	RUDBECKIA HIRTA	BLACK EYED SUSAN	18" O.C.	1 QT.
40	RP	RATIBIDA PINNATA	YELLOW CONEFLOWER	18" O.C.	1 QT.



LOLA VALLEY NATIVE PLANTING LOCATIONS

GENERAL NOTES:

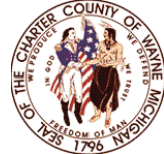
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6. SEED MIXES AND DETAILS FOR LOLA VALLEY, VENOY PARK AND THE INKSTER ROAD CSO PROJECT SITES ARE SHOWN ON SHEET 1.

MAINTENANCE AND GUARANTEE:

1. THE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPING SPECIFIED HEREIN FOR ONE (1) YEAR FOLLOWING APPROVAL OF PRELIMINARY INSPECTION. THE CONTRACTOR SHALL RESPOND WITHIN TWO (2) WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT/REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
2. REFER TO SPECIFICATIONS, SECTION 02950 LANDSCAPING FOR MAINTENANCE REQUIREMENTS.



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SHEET NAME
LOLA VALLEY
NATIVE PLANTING
AREA 2

SCALE: AS SHOWN

NORTH
SHEET NUMBER
2 OF 5



LOLA VALLEY PLANTING AREA 3



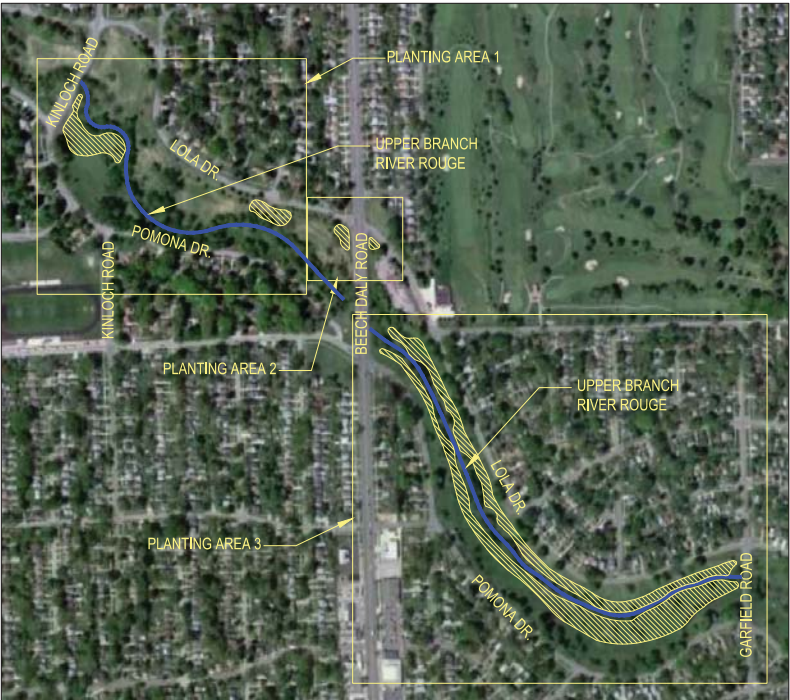
PLANTING DETAIL 3A (0.008 ACRES)

PLANTING AREA 3 PLANT LIST:

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SPACING	CONT
EP	20	ECHINACEA PURPUREA	PURPLE CONEFLOWER	18" O.C.	1 QT.
MF	20	MONARDA FISTULOSA	WILD BERGAMOT	18" O.C.	1 QT.
RH	20	RUDBECKIA HIRTA	BLACK EYED SUSAN	18" O.C.	1 QT.
RP	20	RATIBIDA PINNATA	YELLOW CONEFLOWER	18" O.C.	1 QT.



LOLA VALLEY PLANTING AREA 3



LOLA VALLEY NATIVE PLANTING LOCATIONS

- GENERAL NOTES:**
1. ALL EXISTING UTILITIES SHALL BE LOCATED PRIOR TO IMPLEMENTATION.
 2. NO GRADE CHANGE IS PROPOSED.
 3. ALL TRIBUTARIES, RIVERS, STREAMS, WETLANDS ETC. SHALL BE PROTECTED FROM THE DISCHARGE OF FLUIDS, SOILS OR MATERIALS.
 4. ALL EXISTING TREES SHALL BE PROTECTED THROUGHOUT THE DURATION OF THE PROJECT.
 5. REFER TO SPECIFICATION, SECTION 02950 LANDSCAPING FOR SITE PREPARATION, PLANTING, AND MAINTENANCE REQUIREMENTS.
 6. SEED MIXES AND DETAILS FOR LOLA VALLEY, VENNY PARK AND THE INKSTER ROAD CSO PROJECT SITES ARE SHOWN ON SHEET 1.
- MAINTENANCE AND GUARANTEE:**
1. THE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPING SPECIFIED HEREIN FOR ONE (1) YEAR FOLLOWING APPROVAL OF PRELIMINARY INSPECTION. THE CONTRACTOR SHALL RESPOND WITHIN TWO (2) WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT/REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
 2. REFER TO SPECIFICATIONS, SECTION 02950 LANDSCAPING FOR MAINTENANCE REQUIREMENTS.

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SHEET NAME

**LOLA VALLEY
NATIVE PLANTING
AREA 3**

SCALE: AS SHOWN

NORTH

SHEET NUMBER
3 OF 5



LOWER INKSTER CSO PLANTING AREA

- GENERAL NOTES:**
1. THE INKSTER ROAD CSO PROJECT SITE IS LOCATED EAST OF INKSTER ROAD, NORTH OF MICHIGAN AVENUE AND SOUTH OF AVONDALE STREET.
 2. ALL EXISTING UTILITIES SHALL BE LOCATED PRIOR TO IMPLEMENTATION.
 3. NO GRADE CHANGE IS PROPOSED.
 4. ALL TRIBUTARIES, RIVERS, STREAMS, WETLANDS ETC. SHALL BE PROTECTED FROM THE DISCHARGE OF FLUIDS, SOILS OR MATERIALS.
 5. ALL EXISTING TREES SHALL BE PROTECTED THROUGHOUT THE DURATION OF THE PROJECT.
 6. REFER TO SPECIFICATION, SECTION 02950 LANDSCAPING FOR SITE PREPARATION, PLANTING, AND MAINTENANCE REQUIREMENTS.

- MAINTENANCE AND GUARANTEE:**
1. THE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPING SPECIFIED HEREIN FOR ONE (1) YEAR FOLLOWING APPROVAL OF PRELIMINARY INSPECTION. THE CONTRACTOR SHALL RESPOND WITHIN TWO (2) WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT/REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
 2. REFER TO SPECIFICATIONS, SECTION 02950 LANDSCAPING FOR MAINTENANCE REQUIREMENTS.



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SHEET NAME

INKSTER CSO NATIVE PLANTING

SCALE: AS SHOWN

ATTACHMENT B

Lola Valley Seed Mixes and Plant List Installation proposed for Spring 2012

Prairie seed mix (7.1 acres total)

Scientific name	common name	lbs/ac
<i>Allium cernuum</i>	Nodding Wild Onion	0.063
<i>Agropyron trachycaulum</i>	Slender Wheat Grass	1.000
<i>Andropogon scoparius</i>	Little Bluestem	3.000
<i>Asclepias tuberosa</i>	Butterfly Weed	0.094
<i>Aster laevis</i>	Smooth Blue Aster	0.188
<i>Aster nova-angliae</i>	New England Aster	0.125
<i>Avena sativa</i>	Common Oat	22.00
<i>Carex bicknellii</i>	Bicknell's Oval Sedge	0.063
<i>Cassia fasciculata</i>	Partridge Pea	0.398
<i>Coreopsis lanceolata</i>	Sand Coreopsis	0.450
<i>Coreopsis tripteris</i>	Tall Coreopsis	0.125
<i>Echinacea purpurea</i>	Purple Coneflower	0.830
<i>Elymus canadensis</i>	Nodding Wild Rye	1.000
<i>Heliopsis helianthoides</i>	Early Sunflower	0.188
<i>Lespedeza capitata</i>	Roundhead Bushclover	0.094
<i>Liatris aspera</i>	Rough Blazing Star	0.125
<i>Lolium multiflorum</i>	Annual Rye	6.000
<i>Lupinus perennis</i>	Lupine	0.180
<i>Monarda fistulosa</i>	Bergamot	0.063
<i>Penstemon digitalis</i>	Foxglove Beardtongue	0.125
<i>Physostegia virginiana</i>	False Dragonhead	0.031
<i>Potentilla arguta</i>	Prairie Cinquefoil	0.063
<i>Pycnanthemum virginianum</i>	Common Mountain Mint	0.125
<i>Ratibida pinnata</i>	Yellow Coneflower	0.500
<i>Rudbeckia hirta</i>	Black-Eyed Susan	0.250
<i>Silphium terebinthinaceum</i>	Prairie Dock	0.020
<i>Solidago graminifolia</i>	Grassleafed Goldenrod	0.031
<i>Solidago nemoralis</i>	Old-Field Goldenrod	0.125
<i>Solidago riddellii</i>	Riddell's Goldenrod	0.094
<i>Solidago rigida</i>	Stiff Goldenrod	0.125
<i>Solidago speciosa</i>	Showy Goldenrod	0.125
<i>Verbena stricta</i>	Hoary Vervain	0.250
<i>Vernonia missurica</i>	Common Ironweed	0.125
<i>Veronicastrum virginicum</i>	Culver's Physic	0.010
<i>Zizia aurea</i>	Golden Alexander	0.063
	total	38.048

Wet to mesic seed mix (8.2 acres total)

Scientific name	common name	lbs/ac
<i>Andropogon gerardii</i>	Big Bluestem Grass	3.000
<i>Asclepias incarnata</i>	Swamp Milkweed	0.063
<i>Aster laevis</i>	Smooth Blue Aster	0.016
<i>Aster nova-angliae</i>	New England Aster	0.031
<i>Avena sativa</i>	Common Oat	22.00
<i>Calamagrostis canadensis</i>	Blue Joint Grass	0.063
<i>Carex annectens</i>	Yellow-Fruited Sedge	0.063
<i>Carex bebbii</i>	Bebb's Sedge	0.063
<i>Carex normalis</i>	Normal Sedge	0.063
<i>Carex vulpinoidea</i>	Fox Sedge	0.125
<i>Cassia fasciculata</i>	Partridge Pea	0.250
<i>Elymus canadensis</i>	Canada Wild Rye	1.000
<i>Elymus virginicus</i>	Virginia Wild Rye	4.000
<i>Epilobium coloratum</i>	Cinnamon Willow Herb	0.015
<i>Eupatorium perfoliatum</i>	Boneset	0.015
<i>Hypericum pyramidatum</i>	Great St. John's Wort	0.063
<i>Iris virginica</i>	Blue Flag Iris	0.125
<i>Liatris spicata</i>	Spiked Blazing Star	0.188
<i>Lobelia siphilitica</i>	Great Blue Lobelia	0.031
<i>Lolium multiflorum</i>	Annual Rye	6.000
<i>Mimulus ringens</i>	Monkey Flower	0.031
<i>Monarda fistulosa</i>	Bergamot	0.063
<i>Panicum virgatum</i>	Switch Grass	0.250
<i>Physostegia virginiana</i>	Showy Dragonhead	0.063
<i>Pycnanthemum virginianum</i>	Mountain Mint	0.063
<i>Ratibida pinnata</i>	Yellow Coneflower	0.250
<i>Rudbeckia hirta</i>	Black Eyed Susan	0.250
<i>Scirpus atrovirens</i>	Dark Green Rush	0.500
<i>Solidago riddellii</i>	Riddell's Goldenrod	0.063
<i>Solidago rigida</i>	Rigid Goldenrod	0.125
<i>Sorghastrum nutans</i>	Indian Grass	4.000
<i>Spartina pectinata</i>	Prairie Cord Grass	0.188
<i>Vernonia fasciculata</i>	Common Ironweed	0.031
<i>Veronicastrum virginicum</i>	Culver's Physic	0.063
<i>Zizia aurea</i>	Golden Alexander	0.031
Total		43.145

Herbaceous Plants

60	<i>Echinacea purpurea</i>	Purple Coneflower
60	<i>Monarda fistulosa</i>	Bergamot
60	<i>Rudbeckia hirta</i>	Black Eyed Susan
60	<i>Ratibida pinnata</i>	Yellow Coneflower

ATTACHMENT C

Invasive Species Management Plan
For burn units at Detroit's
Eliza Howell Park
Rouge Park

Submitted by Friends of the Rouge for
Transforming the Rouge Area of Concern from Mowed Down to Grown Up
Funded by the Great Lakes Restoration Initiative

2012

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Introduction

In the spring of 2012, 10 + acres in Detroit's Eliza Howell Park and Rouge Park were burned to restore upland habitat in the Rouge River Watershed as part of a Great Lakes Restoration Initiative funded project to advance delisting of the benthos beneficial use impairment and ultimately leading to the removal of the Fish and Wildlife Habitat and Population Beneficial Use Impairment. Objectives for the project include increasing the native vegetation from 0% to 75%.

Background

Eliza Howell and Rouge Park are both Detroit city-owned parks that encompass portions of the Rouge River. Habitats include riparian forest, wetlands and upland habitat. Eliza Howell Park is 250 acres and Rouge Park is 1,195 and are considered regional parks. They protect relatively large areas of habitat within a highly urbanized area.

In 1999, the City of Detroit received funding through the Rouge River National Wet Weather Demonstration Project Grant to re-vegetate two acres in Eliza Howell Park with native wildflowers and grasses and to establish a native prairie and wildflower interspersed with wetland on 15 acres of parkland in Rouge Park.

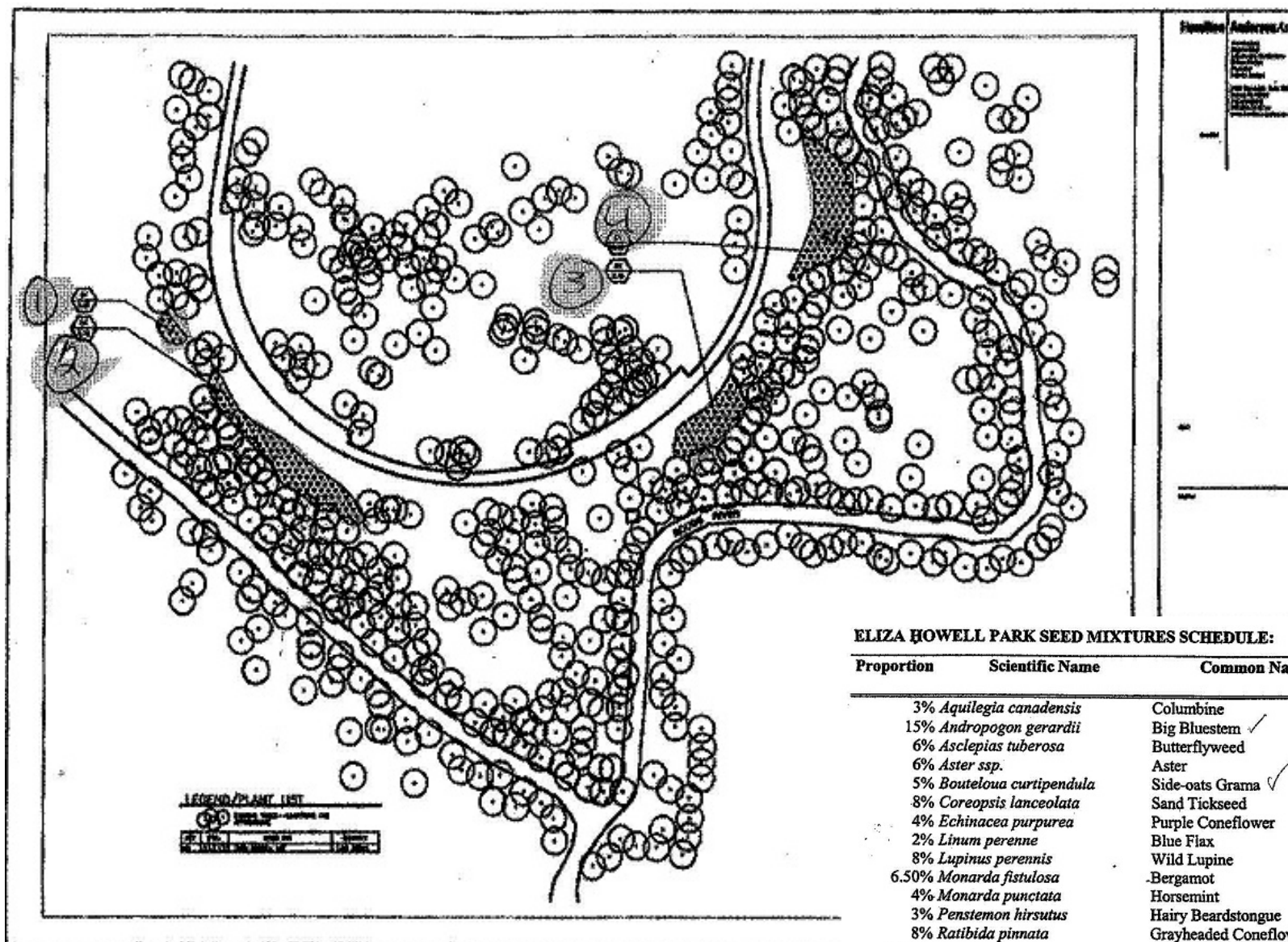
The work was contracted out to Michigan Wildflower Farm with assistance from the City Recreation Department. Existing vegetation (mainly turfgrass) was removed with mowing, clearing and several applications of Roundup. Plantings were done by seed in November 2000. It took many years for the plantings to establish, especially the areas with native grasses.

Eliza Howell Park

In Eliza Howell Park, there were four planting areas, all at the southern end of the circle drive in the north portion of the park (see map and seed mixture list). The seed mixture was designed for a dry sunny area. Initially, the edges of the areas were mowed regularly and the entire planting mowed occasionally. Esther Durnwald from Michigan Wildflower Farm made regular visits to check on the plantings to determine mowing frequency through 2003 (see photo).

Due to budget cuts and a dispute over park maintenance, mowing in Eliza Howell Park became sporadic in 2009. By 2012, the park was rarely being mowed at all. While the seed bank remained, the plantings became overgrown and difficult to distinguish (see photos).

Eliza Howell Park Planting Plan, 2000





Above: Esther Durnwald of Michigan Wildflower Farm surveys Eliza Howell Park planting in 2003 and close up of natives.

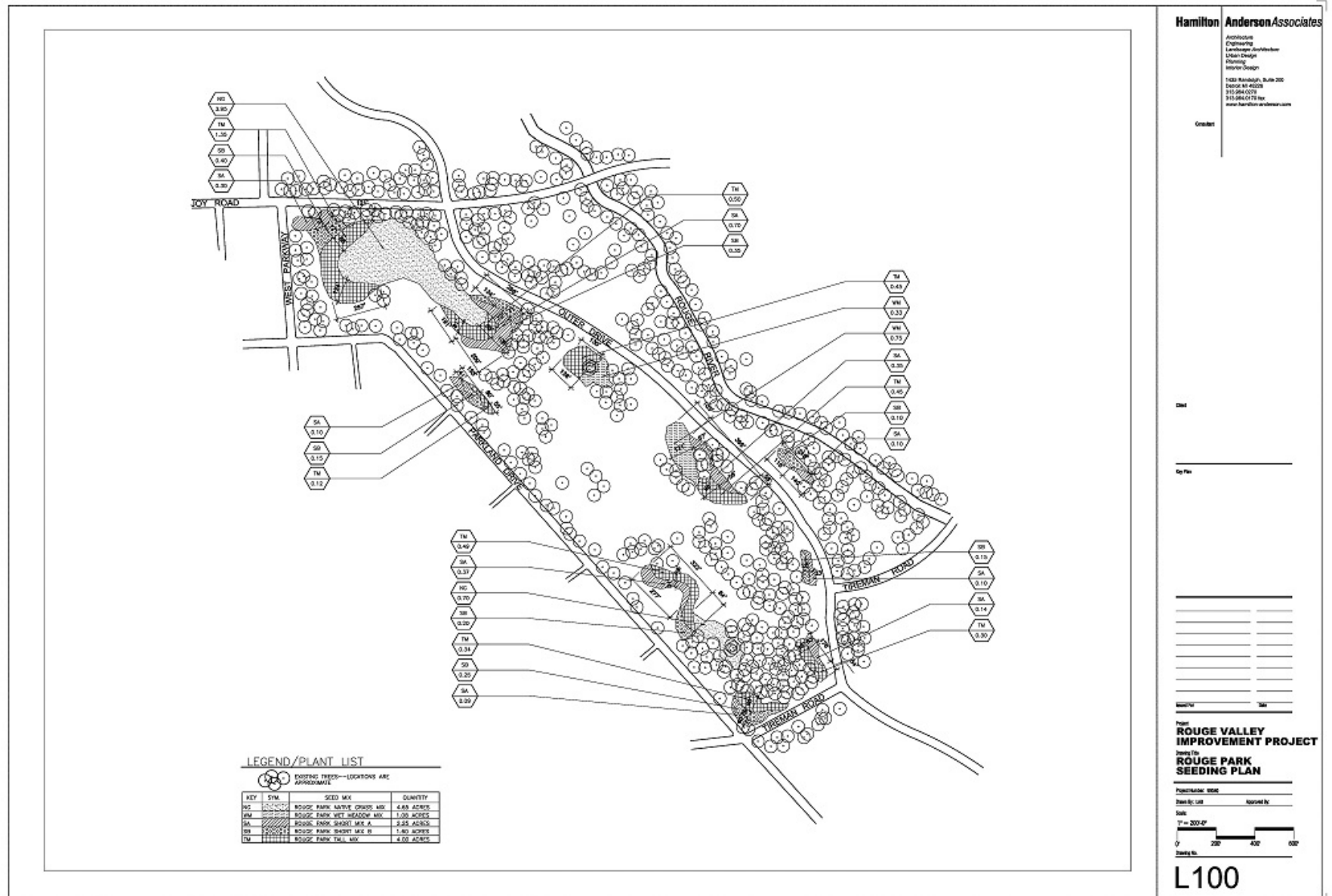
Left: Planting area in spring 2010

Rouge Park

In Rouge Park, the plantings were concentrated in Hawthorn Meadows, a 40 acre area bounded by Joy Road to the north, Tireman Road to the south, West Parkway/Parkland to the west, and Outer Drive to the east (with the exception of one small area on the east side of Outer Drive)(see map). There were nine separate areas and four different seed mixes. The largest area at the north end contained mainly grasses; a wet area on the east side was planted with a wet meadow mix.

Initially, the borders of the plantings were mowed regularly and the plantings mowed occasionally under the direction of Durnwald. Once her contract expired, the City was tasked with maintaining the plantings. Friends of the Rouge, Environmental Consulting & Technology, Inc. and the Friends of Rouge Park became concerned that the planting borders were not being maintained and were too difficult for the mowing crews because the plantings were so scattered. There was also some concern that City officials preferred to return the area to manicured turfgrass. Friends of the Rouge worked with the local middle school to create some temporary signage along the borders.

Rouge Park Planting Plan, 2000



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 www.hamiltonanderson.com

Consult

Sheet

Key Plan

Project: **ROUGE VALLEY IMPROVEMENT PROJECT**
 Phase: **ROUGE PARK SEEDING PLAN**

Prepared by: _____

Drawn by: _____

Date: _____

Scale: 1" = 200'

0 200 400 600

Sheet No. _____

ROUGE PARK SEED MIXTURES
SCHEDULE:
NATIVE GRASS MIX:

Proportion	Scientific Name	Common Name
40%	<i>Andropogon gerardii</i>	Big Bluestem
5%	<i>Panicum virgatum</i>	Switch Grass
35%	<i>Schizachyrium scoparium</i>	Little Bluestem
20%	<i>Sorghastrum nutans</i>	Indian Grass
100%		

WET MEADOW MIX:

Proportion	Scientific Name	Common Name
8%	<i>Andropogon gerardii</i>	Big Bluestem
9%	<i>Asclepias incarnata</i>	Swamp Milkweed
6%	<i>Aster novae-angliae</i>	New England Aster
3%	<i>Desmodium canadense</i>	Showy tick-trefoil
9%	<i>Eupatorium maculatum</i>	Joe-Pye Weed
9%	<i>Eupatorium perfoliatum</i>	Boneset
2%	<i>Euthamia graminifolia</i>	Grass Leaved Goldenrod
3%	<i>Iris Versicolor</i>	Wild Blue Iris
0.50%	<i>Lobelia cardinalis</i>	Cardinal Flower
0.50%	<i>Lobelia siphilitica</i>	Blue Lobelia
4%	<i>Monarda fistulosa</i>	Bergamot
2%	<i>Petalostemum purpureum</i>	Purple Prairie-Clover
7%	<i>Ratibida pinnata</i>	Grayheaded Coneflower
4%	<i>Rudbeckia subtomentosa</i>	Sweet Blackeyed Susan
5%	<i>Silphium perfoliatum</i>	Cup Plant
4%	<i>Silphium terebinthinaceum</i>	Prairie dock
2%	<i>Solidago riddellii</i>	Riddell's Goldenrod
7%	<i>Solidago rigida</i>	Stiff Goldenrod
7%	<i>Verbena hastata</i>	Blue Vervain
6%	<i>Vernonia fasciculata</i>	Ironweed
2%	<i>Veronicastrum virginicum</i>	Culver's root
100%		

SHORT MIX:

Proportion	Scientific Name	Common Name
3%	<i>Anemone cylindrica</i>	Thimbleweed
5%	<i>Aquilegia canadensis</i>	Columbine
7%	<i>Asclepias tuberosa</i>	Butterflyweed
9%	<i>Aster ssp.</i>	Aster
5%	<i>Helianthus occidentalis</i>	Western sunflower
9%	<i>Lupinus perennis</i>	Wild Lupine
5%	<i>Monarda punctata</i>	Horsemint
4%	<i>Penstemon hirsutus</i>	Hairy Beardstongue
10%	<i>Rudbeckia hirta</i>	Blackeyed Susan
20%	<i>Schizachyrium scoparium</i>	Little Bluestem
6%	<i>Verbena stricta</i>	Hoary Vervain
83%		
Mix A Sown Separately		
12%	<i>Coreopsis lanceolata</i>	Sand Tickseed
Mix B Sown Separately		
5%	<i>Echinacea purpurea</i>	Purple Coneflower
100%		

TALL MIX:

Proportion	Scientific Name	Common Name
10%	<i>Andropogon gerardii</i>	Big Bluestem
3%	<i>Aquilegia canadensis</i>	Columbine
5%	<i>Asclepias syriaca</i>	Common Milkweed
8%	<i>Aster ssp.</i>	Aster
5%	<i>Coreopsis lanceolata</i>	Sand Tickseed
2%	<i>Desmodium canadense</i>	Showy Tick-trefoil
3%	<i>Eryngium yuccifolium</i>	Rattlesnake Master
10%	<i>Ratibida pinnata</i>	Grayheaded Coneflower
6%	<i>Rudbeckia hirta</i>	Blackeyed Susan
5%	<i>Silphium integrifolium</i>	Rosinweed
4%	<i>Silphium perfoliatum</i>	Cup Plant
8%	<i>Solidago rigida</i>	Stiff Goldenrod
10%	<i>Sorghastrum nutans</i>	Indian Grass
5%	<i>Verbena stricta</i>	Hoary Vervain
84%		
Sown Separately:		
7%	<i>Monarda fistulosa</i>	Bergamot
5%	<i>Penstemon digitalis</i>	Foxglove Beardstongue
4%	<i>Silphium terebinthinaceum</i>	Prairie dock
16%		
100%		



Above: Temporary signage installed by brownies, spring 2003.

Right: Grow Zone sign installed in Nov 2006



2012

Burning and Seeding

Prescribed burns were conducted in Rouge Park and Eliza Howell Parks on April 11, 2012 through a grant from the Great Lakes Restoration Initiative managed by the Alliance of Rouge Communities. The Rouge Park burn was designed to restore five acres of native



Students spread seed at Eliza Howell Park after the burn, spring 2012

plantings within the prairie. There were two burn units in Rouge Park. The southern unit contained mainly European grasses while the northern unit had become overgrown with woody shrubs. There were also two burn units in Eliza Howell Park, a west and an east.

Following both burns, volunteers spread native seeds mixed with sand over the burned areas at several volunteer days held in May and June 2012.

Rouge Park Invasive Treatment

On June 2, 2012, woody shrubs were removed from all of the south and the southern end of the northern burn unit at Rouge Park as part of the annual Rouge Rescue cleanup. Volunteers cut and hauled the shrubs and herbicide applicators from the City of Detroit applied a Basal Cut Stem herbicide blend of 20% Garlon 4 Ultra, 2% Milestone, 78% HyGrade EC that was donated by ITC Holdings. Herbicide was applied with sponge brushes.



Volunteers cut, treat and haul woody shrubs from Rouge Park as part of Rouge Rescue June 2, 2012



City of Detroit certified pesticide applicators apply herbicide on thistle in Rouge Park, June 13, 2012

At Rouge Park, the southern unit was heavily infested with Canada thistle. The City of Detroit had the capacity to do more herbicide treatment so FOTR worked with them to treat the most infested northern end of the southern burn unit on June 13, 2012 with a dilution of the herbicide used earlier. Backpack sprayers were used to treat about 1 acre. Following that,

the City was no longer able to provide herbicide applicators due to austerity measures. As the thistle got closer to blooming, FOTR arranged a work day with Boy Scouts of America at the park on June 27. Twenty one scouts and other volunteers used 25 swing

blades provided by the City and were able to knock down all of the non-treated Canada thistle, preventing it from seeding into the treated area. Some additional native plants (20 rattlesnake master and 9 hoary vervain) were planted in the treated area on July 11, four weeks after any herbiciding.



Scouts use swing blades to prevent thistle from flowering, June 27, 2012

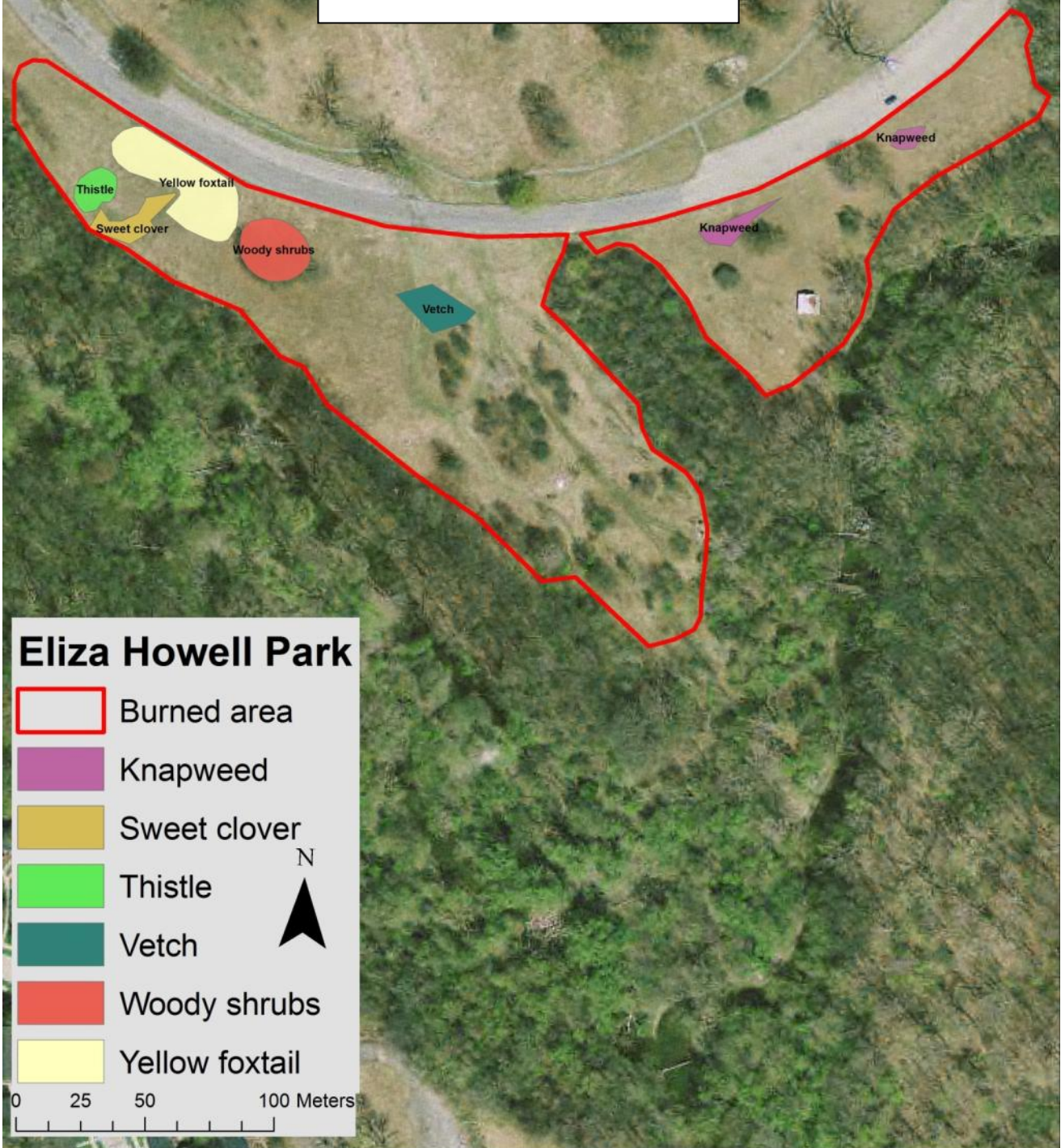
Assessment

Friends of the Rouge began their assessment in June 2012 following the plantings. In Rouge Park, that assessment led to immediate treatment because the resources were available and the timing of treatment at the start of the growing season necessitated it.

Assessments were done on June 27, 2012. All four burn units were walked, invasive species were noted, large patches marked with a GPS and photographed.

Invasive plant species were identified in all burn units in both parks. The Eliza Howell east unit was in the best condition (see map on page 12). Two small patches of spotted knapweed were observed in the western section of the unit. The Eliza Howell west unit had the highest diversity of invasive plant species. A large patch of crown vetch was identified in the northeast section of the burn unit. Buckthorn species were observed under the canopy of several large trees in the north central portion of the unit. Small patches of sweet clover and Canada thistle were found in the western half of the unit and a large infestation of yellow foxtail was observed in the northwest section. Queen Anne's lace was also identified in the northeast section.

Eliza Howell Park Assessment– 6/27/12
Invasive Locations after
Controlled Burns



6/27/12 Eliza Howell Park Assessment:

Clockwise from left:

Crown vetch, Sweet clover, diverse prairie, Yellow foxtail



The Rouge Park north burn unit was highly infested with hawthorn shrubs. The goal for the controlled burn was to set back the shrubs but the early spring caused faster growth, making the burn less effective for this purpose. Hawthorn is a native tree but is not desired in the tallgrass prairie restoration. The Rouge Park south unit had a high concentration of Canada thistle throughout the northern half of the burn area and one small patch in the southern half. A small patch of spotted knapweed was found in the northeast section of the south burn area.



6/27/12 Assessment: Black swallowtail butterfly in Butterfly milkweed in burned area



6/27/12 Assessment: Burned hawthorn and other woody shrubs

Rouge Park Assessment– 6/27/12
Invasive Locations after
Controlled Burns



Management Plan

Invasive species identified in the Eliza Howell Park and Rouge Park burn units were Canada Thistle (*Cirsium arvense*), Yellow Foxtail (*Setaria lutescens*), Crown Vetch (*Coronilla varia*), Queen Anne's Lace (*Daucus carota*), Sweet Clover (*Melilotus alba*, *Melilotus officinalis*), Spotted Knapweed (*Centaurea biebersteinii*), and Buckthorn (*Rhamnus Spp.*). Hawthorn (*Crataegus Spp.*), an undesirable native tree species, was also observed in one burn unit. Management goals of the burn units are to increase diversity. Seeding done following the burns should increase diversity but will take several seasons to establish.

Canada thistle is an herbaceous invasive plant spread by seed and rhizomes. Each plant produces 1500 to 5000 seeds that are dispersed by wind. Mechanical control of Canada thistle involves hand pulling plants in small areas. Larger areas may be mowed before seeds fully develop. Chemical control involves the application of glyphosate in spring and fall. Two applications of glyphosate in spring and fall after mowing have proven to be successful.

Yellow Foxtail is a non-native annual grass spread by seed. Seeds germinate throughout the growing season. Mechanical control of yellow foxtail involves hand pulling or mowing prior to the plant setting seed. Mowing throughout the season may be necessary as new seed heads develop. Once the prairie plants become established they will outcompete yellow foxtail. A preemergence may be applied twice in the growing season to control yellow foxtail chemically. Applying glyphosate is another method.

Crown Vetch is an invasive herbaceous perennial in the legume family. The plant spreads by seed and by rhizomes that can grow to 10 feet, enabling the plant to quickly take over an area. Mechanical control of crown vetch includes hand pulling, mowing or prescribed burns in late spring. Repeated mowing or burning will be necessary for several successive years to control this species.

Queen Anne's lace, or wild carrot, is a biennial with small barbed seeds that are dispersed by animals and wind. It invades dry prairies, abandoned fields, and road sides. As native grasses and herbaceous plants become established Queen Anne's lace tends to decline. Mechanical control includes hand pulling or mowing before seeds set. Chemical herbicides are effective in larger areas.

Sweet Clover is a biennial with seeds being dispersed by water and wind. It is aggressive in disturbed areas and prairies. It is short lived so preventing seed growth is critical to controlling sweet clover. Mechanical control includes hand weeding when the soil is moist, cutting back plants before seeds set and prescribed burns taking place in early spring the first year and late spring the following year. Chemical control includes applying a general herbicide such as glyphosate.

Spotted knapweed is an herbaceous biennial or perennial. Seeds are dispersed by wind and germinate throughout the growing season. Mechanical control includes hand pulling or digging out plants, taking care to get the entire root system. Controlling large infestations may require chemical control.

Buckthorn is a non-native invasive shrub. Common and Glossy Buckthorn shrubs are common throughout Southeast Michigan. Buckthorn produces an abundance of fruit/seeds that are spread by birds and small mammals. The shrubs leaf out early in spring and last into late fall, shading out the native vegetation. Mechanical control of the species includes hand pulling small shrubs and repeated cutting of larger shrubs. Prescribed burns are another control method. Chemical control involves applying foliar herbicides with a surfactant. A combination of hand cutting and applying herbicide to the cut stump has been successful in controlling buckthorn. Repeated control measures will be necessary.

Hawthorn is a native shrub that produces fruit/seeds that are spread by birds and small mammals. Control of this woody shrub is similar to that of the buckthorn. Mechanical control involves hand cutting shrubs or pulling small saplings. Chemical control involves herbicide application.

Other invasive plant species may become established in the burn units. Invasive plants within the prairie at Rouge Park but not detected in the burn units are phragmites (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*). Both of these are restricted to a wet meadow near the south burn unit. Garlic mustard (*Alliaria petiolata*) and dame's rocket (*Hesperis matronalis*) are found in both parks but do not seem to spread outside of the forested floodplain.

Invasive plant species common in southeast Michigan that may become a threat are honeysuckle species (*Lonicera spp.*), oriental bittersweet (*Celastrus orbiculatus*), Japanese barberry (*Berberis thunbergii*), autumn olive (*Elaeagnus umbellata*), swallow-wort species (*Cynanchum spp.*), and more. If any are observed they should be appropriately addressed.

Overall Recommendations

Priority in controlling invasive plant species in all burn units should be given to the species that pose the greatest threat to the native prairie ecosystem. A planned approach to controlling invasives is important. It is beneficial to tackle small outlying patches of invasive plants dispersed by seed first and then work to control large patches. The opposite is true for invasive plants with seeds dispersed by birds. Because birds are attracted by the large areas of fruiting shrubs it is best to control these areas first, then focus efforts to control outliers. In all cases care should be taken to prevent the loss of native species while treating the invasives.

Monitoring the burn units will be needed to evaluate success of control measures and to detect new invasive species before they become established. Burning adjacent areas will help to control other weed seeds and increase overall diversity.

Given the budget crisis in the City of Detroit managing the burn units in Rouge and Eliza Howell Parks should maximize the use of volunteer labor. Volunteers should be taught to identify invasive species and control techniques. Volunteers also need clear direction and oversight. Monitoring was done monthly from June through September 2012, with the assistance of local residents, maintenance has been conducted by Greening of Detroit at Eliza Howell Park and Friends of the Rouge at Rouge Park.

Eliza Howell Park

Importance should be given to control invasives in the east burn unit. The east unit had high native diversity and only two small patches of spotted knapweed. Invasive control efforts should focus on removing the spotted knapweed from these two small areas. Care should be taken to prevent seed from developing. Hand pulling plants before or in flowering stage is recommended given the small size of the area affected. Seed heads should be placed in plastic trash bags. Volunteers should wear gloves and avoid contact with skin. Seeds germinate throughout the growing season so multiple workdays may be necessary.

Invasives identified in the west unit are Canada thistle, sweet clover, crown vetch, buckthorn, yellow foxtail, and Queen Anne's lace. Control recommendations for the west unit are to employ a combination of methods including a timed mowing regime and hand pulling.

Hand pulling the Canada thistle and sweet clover is recommended due to the small infestation in the burn unit. Canada thistle should be removed before setting seed late in the growing season. Second year sweet clover should be pulled in the spring to prevent flower and seed production. First year plants can be pulled in fall when they stand out among the native prairie plants and results in less stress to the native plants. Hand pulling when the soil is moist is best. Buckthorn saplings should be hand pulled in the burn unit. Larger shrubs, if found, should be cut and herbicide applied to the cut stump.

Mowing the crown vetch in late spring for several successive years or treating the area of infestation with an herbicide in late spring and reseeding is recommended. Areas heavily populated with Queen Anne's lace should be mowed in July. Queen Anne's lace interspersed with natives should be hand pulled in July to prevent seed production. Mowing the yellow foxtail is also recommended for areas with dense populations. Yellow foxtail growing with native species should be hand pulled or flower heads removed to prevent

seeds. Foxtail seeds germinate throughout the growing season and will require control throughout the season.

Rouge Park

Controlling invasives in the two burn units in Rouge Park should begin by hand pulling the small areas of spotted knapweed and Canada thistle in the south burn unit. Preventing these from taking hold and spreading is possible if dealt with while the population is low.

The large infestation of Canada thistle at the north end of the south unit should be eradicated by mowing followed by an application of herbicide in spring and fall.

The Rouge Park north burn unit has a high population of hawthorn shrubs dispersed throughout much of the unit. Treatment must take care to preserve the native prairie grasses and forbs growing with the hawthorns. Hawthorn is native; however, the restoration goals are to maintain the prairie. Hawthorn will outcompete the prairie species and must be controlled. Hawthorns should be removed by hand cutting the shrubs and treating the cut stumps with an herbicide before fruit develops in late summer. Hawthorn exists outside of the burn areas and will provide a seed source for future establishment. Monitoring and control efforts must be ongoing to manage the hawthorn population.

Resources:

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WAYNE COUNTY / ALLIANCE OF ROUGE COMMUNITIES

Wayne County Grow Zone Restoration 2012**Long Term Invasive Species Management Strategy**

Great Lakes Restoration Initiative Program Grant

**NE****NISWANDER ENVIRONMENTAL, LLC**

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I. PROJECT BACKGROUND

The Alliance of Rouge Communities (ARC) and Wayne County has received a FY2010 Great Lakes Restoration Initiative (GLRI) Program Grant (GL-00E00643), with the intent of restoring green space within the Upper, Lower, and Middle Branches of the Rouge River Area of Concern. Under this grant, “Transforming the Rouge from Mowed Down to Grown Up”, Niswander Environmental was contracted by Wayne County in May 2012 to assess existing conditions of 17 selected Wayne County Grow Zone sites totaling approximately 25 acres. An additional 3 Grow Zone sites were added to the project once they were completed in 2012. These 20 sites were designed to manage floodwaters from the Rouge River and its tributaries as well as stormwater runoff from surrounding areas in the County. Specifically, Niswander Environmental was to assess each Grow Zone for potential restoration activities to be completed as part of this grant. The assessment focused on identifying the presence and extent of invasive species at each site and the recommended treatment for their control. In addition, the restoration efforts were to be prioritized, since only 10 acres of restoration activities are included in this grant.

The Grow Zones were divided according to their location within the greater Rouge watershed. Of the 20 sites, fifteen are located along Hines Drive within the Middle Rouge watershed, while the Upper Rouge contains two Grow Zones and the Lower Rouge contains three. All but one (Commerce Court Grow Zone) are located within a Wayne County Park setting that is frequently utilized by the public. Individually, each Grow Zone provides wildlife habitat, water quality benefits, visual buffers, and improved air quality. As a whole, these sites are part of the Rouge River riparian corridor and provide active and passive recreational opportunities, flood storage, critical habitat linkages, and connectivity of valuable greenspace.

This report outlines Niswander Environmental’s assessment of each Grow Zone’s restoration potential, the recommended priority of restoration activities, summary of restoration activities completed to date, and identifies recommendations for a long-term invasive species management plan.



II. METHODS

Over three dates in late May and early June of 2012, Niswander Environmental completed a comprehensive field evaluation of the 17 selected Grow Zones as identified by the County. Three additional, newly created sites were assessed in November 2012. Niswander Environmental assessed and characterized each of the twenty sites according to its habitat type, significance, and vegetative quality as it relates to the remainder of the property, immediate surrounding area, and the County as a whole. Representative digital photographs were taken at each of the 20 sites. While evaluating each site in the field, Niswander Environmental paid particular attention to potential restoration and/or stewardship opportunities, which includes active management of invasive vegetation, habitat enhancement, and general future maintenance. Niswander Environmental evaluated this information and completed a report recommending short-term site restoration priorities in July 2012. A description of each Grow Zone is presented in Section III of this report. Each Grow Zone is detailed based on its habitat community type, floristic quality, dominant species, and need for restoration.

Most of the Grow Zones were designed and initially restored as meadow or prairie habitat. While most of the Grow Zones are of moderate quality, all contain some form of invasive vegetation, albeit in varying degrees of severity. Within the wetland or wet meadow areas, the primary non-native species are generally reed canary grass, Phragmites, and/or narrow-leaf cattail. Each of these are very aggressive and can rapidly advance within a given area by out-competing native plants and eventually forming monotypic stands, thereby reducing diversity. Within the upland or mesic meadow areas, woody species such as buckthorn, honeysuckle, autumn olive, and/or Siberian elm are established or beginning to expand from adjacent woodlands. Although native, other woody species such as cottonwood threaten the meadow community type as they rapidly advance. Also within these meadow sites, aggressive herbaceous species such as spotted knapweed, clover, teasel, and thistle are becoming common.

Properly maintaining the Grow Zones to remove the invasive and aggressive species is crucial to ensure the longevity of these established sites. While it appears that most of the sites would benefit from some form of invasive species control, Niswander Environmental recommended 13 priority sites for restoration activities in July 2012 to be completed as part of this grant. The 13 sites listed in Table 1 below were selected based on the amount of restoration that could be completed for the price, visibility, and ease/effectiveness of restoration. At these sites, two methods were used to reduce and control the presence of invasive species: prescribed burns and herbicide application (often in conjunction with cutting).



Table 1. Selected Priority Grow Zone Sites to be Managed in 2012.

Site	Size (Acres)	Primary Invasive Spp.	Control Method
GZ-A (Bennett)	1.80 ac	Phragmites, buckthorn, thistle, knapweed	prescribed burn + herbicide
GZ-C (Inkster Road)	1.60 ac	buckthorn, honeysuckle, rose, thistle	prescribed burn
GZ-D (Ford Road)	1.13 ac	Phragmites, reed canary grass, cattail	herbicide
GZ-1 (Waterford Bend)	0.60 ac	Phragmites, teasel, reed canary grass, thistle	prescribed burn + herbicide
GZ-2 (Six Mile Road)	0.80 ac	teasel, thistle, buckthorn, olive, reed canary	prescribed burn + herbicide
GZ-3 (SpringHill)	0.60 ac	buckthorn, honeysuckle, thistle, reed canary	herbicide
GZ-4 (Parkview)	0.30 ac	buckthorn, honeysuckle, thistle	herbicide
GZ-5 (Newburgh Pointe)	0.50 ac	buckthorn, honeysuckle, spotted knapweed	herbicide
GZ-6 (Sumac Pointe)	1.1 ac	buckthorn, honeysuckle, thistle, knapweed	prescribed burn
GZ-7 (Newburgh Dam)	0.63 ac	buckthorn, honeysuckle, thistle	herbicide
GZ-8a (Plymouth/A ² Rd)	1.26 ac	buckthorn, honeysuckle, thistle, knapweed	prescribed burn
GZ-8b (Levan Knoll)	0.38 ac	buckthorn, multiflora rose, thistle,	prescribed burn
RG-1 (Newburgh Pointe)	0.20 ac	Phragmites, thistle, spotted knapweed	herbicide

In Section III of this report, long-term invasive species management recommendations are detailed for each Grow Zone as well as a summary of restoration work completed in 2012 by Niswander Environmental and David Borneman, LLC. The following is a description of the two primary management methods recommended for the Grow Zones restoration, with a summary of the treatments completed in the summer and fall of 2012.

Herbicide Treatments

Once the Grow Zone sites were assessed and prioritized, Niswander Environmental began to chemically treat selected sites based on a number of factors. Treatment techniques vary depending on the target species, its size and density, and the time of year. Glyphosate (*i.e.*, Rodeo[®], AquaNeat[®], or RoundUp Pro[®]) has proven to be an effective herbicide in treating a number of herbaceous species, including reed canary grass, thistle, teasel, clover, burdock, and many others. A combination of glyphosate and imazapyr (*i.e.*, Habitat[®]) is effective in controlling non-native Phragmites if applied in the late summer or early fall. Finally, it has been our experience that a triclopyr-based herbicide such as Renovate[®] or Garlon 3A[®] successfully controls spotted knapweed and emerging or young woody species. In each case, a surfactant such as Cygnet Plus[®] should be added to the solution at the recommended rate for best results. Table 2 below details the foliar broadcast treatments associated with this project.



Table 2. Foliar Broadcast Herbicide Applications in 2012.

Site	Date	Primary Invasive Spp.	Herbicide
GZ-A (Bennett)	7/20/12	Phragmites, thistle, burdock, teasel, chickory	glyphosate + imazapyr
GZ-1 (Waterford Bend)	7/20/12	Phragmites, reed canary grass, thistle	glyphosate + imazapyr
GZ-3 (SpringHill)	7/20/12	thistle, reed canary, teasel	glyphosate + imazapyr
GZ-4 (Parkview)	7/20/12	thistle, teasel	glyphosate + imazapyr
GZ-A (Bennett)	7/24/12	spotted knapweed	triclopyr
GZ-D (Ford Road)	7/24/12	Phragmites, reed canary grass, cattail	glyphosate + imazapyr
GZ-3 (SpringHill)	7/24/12	emerging buckthorn and honeysuckle	triclopyr
GZ-5 (Newburgh Pointe)	7/24/12	spotted knapweed, buckthorn, honeysuckle	triclopyr
GZ-7 (Newburgh Dam)	7/24/12	knapweed, buckthorn, honeysuckle, thistle	triclopyr
RG-1 (Newburgh Pointe)	7/24/12	Phragmites	glyphosate + imazapyr
RG-1 (Newburgh Pointe)	7/24/12	spotted knapweed, thistle	triclopyr
GZ-D (Ford Road)	8/1/12	Phragmites, reed canary grass, cattail	glyphosate + imazapyr
GZ-3 (SpringHill)	8/1/12	emerging buckthorn, honeysuckle, Siberian elm	triclopyr
GZ-4 (Parkview)	8/1/12	emerging buckthorn, honeysuckle	triclopyr
GZ-5 (Newburgh Pointe)	8/1/12	knapweed, emerging buckthorn, honeysuckle	triclopyr

In general, woody species such as buckthorn, honeysuckle, multiflora rose, Siberian elm, and autumn olive were removed using the cut-stump method, which calls for these shrubs to be cut at the base and immediately treated with a triclopyr-based herbicide such as Renovate[®] or Garlon 3A[®]. It should be noted that these species cannot be removed using this method during the spring, however, when sap is flowing upward to the stems and buds. Therefore, to remove buckthorn and honeysuckle, cut-stump treatments were conducted at Grow Zones 3, 4, 5, and 7 in October 2012, as represented in Table 3 on the following page.

Table 3. Cut-Stump Herbicide Applications in 2012.

Site	Date	Primary Invasive Spp.	Herbicide
GZ-3 (SpringHill)	10/25/12	buckthorn, honeysuckle, Siberian elm	triclopyr (cut-stump)
GZ-4 (Parkview)	10/25/12	buckthorn, honeysuckle	triclopyr (cut-stump)
GZ-5 (Newburgh Pointe)	10/25/12	buckthorn, honeysuckle	triclopyr (cut-stump)
GZ-7 (Newburgh Dam)	10/25/12	buckthorn, honeysuckle	triclopyr (cut-stump)

Chemical treatment of these sites in July, August, and October 2012 resulted in approximately 3.56 acres of 10.00 acres to be restoration under the GLRI GL-00E00643 project.

Prescribed Burn Treatments

Many of the Grow Zones need to undergo periodic disturbance such as burning, grazing, haying, or mowing in order to prevent cool season grasses, shrubs, and trees from becoming established. The use of prescribed burns is perhaps the most effective, economic, and valuable method to control undesirable vegetation. Historically, prairies and meadows were maintained through fire occurring naturally or set by indigenous people. Fire prevents the growth of shrubs and trees while setting back succession to the grassland stage. Prescribed burns also prevent invasive cool-season grasses from becoming established since they are not adapted to withstand fire like many of the prairie species currently present within the Grow Zones. Fire burns the dead plant material that lies above the ground surface and allows the high-quality nutrients from the dead plants to return to the soil. These nutrients fortify the deep roots of the prairie vegetation where the plant will re-sprout in late spring. Rotating controlled burns is the best long-term management of meadows, as it is the natural process that ensures



healthy regeneration of prairie species. Burning the Grow Zones every 2-3 years will maintain the healthiest stands.

Niswander Environmental recommended that 7 Grow Zone sites be burned to meet the goals of this grant project. Each of the Grow Zones that were recommended are highly visible and will benefit greatly from the prescribed burn. In addition to reducing the invasive grasses and forbs present at these sites, the burn will help preserve the meadow/prairie habitat by discouraging the woody species such as sumac, box elder, cottonwood, grape, honeysuckle, and buckthorn, from establishing at their current rates. Burning these seven sites accounted for approximately 7.54 bringing the total acres restored under the GLRI GL-00E00643 project to 11.10 acres. This exceeds the grant goal of 10 total acres by 1.1 acres. Table 4 below represents the sites that were burned by David Borneman, LLC in November 2012.

Table 4. Grow Zones Receiving Prescribed Burns in 2012.

Site	Date	Size	Primary Target Species
GZ-C (Inkster Road)	11/7/12	1.6 ac	buckthorn, honeysuckle, rose, Siberian elm, thistle, clover
GZ-8a (Plymouth and A ² Rd)	11/7/12	1.26 ac	spotted knapweed, thistle, honeysuckle, buckthorn, mullein
GZ-1 (Waterford Bend)	11/8/12	0.6 ac	teasel, Phragmites, reed canary grass, thistle
GZ-2 (Six Mile)	11/8/12	0.8 ac	teasel, thistle, Phragmites, buckthorn, autumn olive, reed canary
GZ-6 (Sumac Pointe)	11/8/12	1.1 ac	buckthorn, honeysuckle, cottonwood, knapweed, thistle, teasel
GZ-8b (Levan Knoll)	11/8/12	0.38 ac	buckthorn, autumn olive, rose, catalpa, thistle, cottonwood
GZ-A (Bennett)	11/17/12	1.8 ac	buckthorn, honeysuckle, knapweed, thistle, sumac, cottonwood



III. SITE DESCRIPTIONS AND MANAGEMENT RECOMMENDATIONS

MIDDLE ROUGE GROW ZONES

GROW ZONE A – BENNETT (GZ –A)

Grow Zone A consists of three different habitat types, including: 1) a restored detention pond/wetland, 2) an adjacent wooded area, and 3) a native wildflower area all within the Bennett Arboretum area of Hines Park. The detention area, which includes a wetland buffer, is generally very diverse and functions to filter sediment and other pollutants prior to entering a channel that flows through the center of this feature. The soils in this area are saturated throughout, with pockets of standing water in addition to the narrow channel.



1) *Restored Detention Pond/Wetland* - Most of wetland portion of GZ-A consists of native wetland species such as sedge, spikerush, cattail, rush, woolgrass, willow, and boneset. However, a majority of the eastern portion, along Hines Drive, is comprised of invasive Phragmites. In addition to Phragmites, other non-native species such as field thistle, spotted knapweed, chickory, Queen Anne's lace, crown vetch, and mullein are common along the perimeter of the Grow Zone, and purple loosestrife was observed in the saturated areas along the channel. Regardless, much of GZ-A is of moderate to moderately-high quality due to the functions it provides and the diversity of vegetation.

Management Recommendations: Niswander Environmental chemically treated the aggressive and invasive plant species on site with the exception of buckthorn in the summer of 2012. We recommend that Phragmites be foliar treated annually each fall with a glyphosate-based, aquatic-safe herbicide such as Rodeo® or AquaNeat® for several growing seasons before transitioning to an imazapyr-based herbicide such as Habitat®. Both glyphosate and imazapyr are non-selective herbicides that should be



applied with care so as to avoid collateral damage to desirable native vegetation. Phragmites has the ability to resist certain herbicides after several years of continued use, and it is our experience that introducing imazapyr after several years of glyphosate applications has been very effective. Please note that the herbicide treatments should be performed by an experienced Certified Pesticide Applicator, and that a Part 33 Aquatic Nuisance Control Permit from the Michigan Department of Environmental Quality (MDEQ) will be required if applying herbicide into an area containing standing water that discharges to a wetland or watercourse.



Phragmites began to yellow shortly following application.

In addition to the Phragmites, purple loosestrife is present in the wetland areas buffering the channel. Although it has yet to form a monoculture or displace native vegetation, this species is extremely aggressive. Niswander Environmental inspected most of the loosestrife plants and noticed that the *Galeruccella* beetle is present. This insect is an effective biological control agent that feeds exclusively on purple loosestrife. Over the course of five to seven years, it is expected that the beetle will kill a vast majority of the existing loosestrife plants; therefore, Niswander Environmental recommends that this area be monitored annually to assess the loosestrife population. Specific treatments to control this species are not warranted at this time.

2) *Wooded Area* - Grow Zone A also includes a small but dense wooded area immediately adjacent to the wetland. The canopy trees in this area primarily consist of oak, although other mature trees such as black cherry, American elm, and box elder are also present. Unfortunately, this area also contains a dense understory of buckthorn, in addition to non-native herbaceous plants such as Dame's rocket, burdock, and thistle.





Management Recommendations: Niswander Environmental recommends cut-stump treatments annually to eradicate buckthorn and other woody species from this area. Cut-stump treatments, which consist of cutting the shrub at the base and applying a triclopyr-based herbicide such as Garlon 3A[®] is a strategy that is somewhat labor intensive but effective. Removing the buckthorn mechanically (*i.e.*, pulling by hand) is labor intensive, but effective. In addition, selective spot-spraying of non-native grasses and forbs may be required each year until a dense understory of native species establishes. Monitoring of this area annually should be conducted, and hand-pulling individual buckthorn sprouts may be necessary each year until the seed source can be depleted.

3) *Native Wildflower Area* - Roughly 750 feet southeast of the wetland and wooded portions lies the Native wildflower area of GZ-A. This upland meadow area is approximately 2 acres in size, and is situated along the west side of Hines Drive. This area offers a diverse collection of upland prairie vegetation such as bee balm, black-eyed susan, coreopsis, mint, Indian grass, big bluestem, sunflowers, coneflowers, and a variety of asters and goldenrods. There are relatively few invasive species, but plants such as spotted knapweed, thistle, buckthorn, vetch, and burdock can advance rapidly if left unmanaged. In addition, woody species such as sumac, grapevine, cottonwood, and elm threaten to eventually transition this area from diverse meadow to scrub-shrub over time.

Management Recommendations: To maintain the upland prairie that has effectively established within this section of GZ-A, David Borneman, LLC introduced a controlled burn to the site in November 2012. The successful burn will aid in reducing the amount of invasive species and native woody species that jeopardize the meadow community. Niswander Environmental recommends burns every other spring at the Arboretum, with annual monitoring and spot spraying of non-native shrubs and forbs if warranted.





NISWANDER ENVIRONMENTAL, LLC
Finding Solutions in a Complex World



GROW ZONE B – NANKIN

Grow Zone B is unique in that it features four separate areas: 1) a tiered raingarden at the Nankin Mills Interpretive Center, 2) a small pond feature at the driveway, 3) a large meadow adjacent to the Interpretive Center, and 4) a second, smaller meadow across Hines Drive from the Interpretive Center.

1) *Tiered Raingarden* - The tiered raingarden is currently overgrown and contains an abundance of non-native species, including Phragmites, thistle, burdock, clover, curly dock, and spotted knapweed. The lowest tier also contains a few Siberian elm and buckthorn. Native wetland species are also present within the system as well that help to filter pollutants.



*Tiered raingarden
at
Nankin Mills
Interpretive Center*



Management Recommendation: Restoration activities were not conducted at the four areas associated with Grow Zone B during the 2012 growing season. Invasive herbaceous species present within and around the raingarden should be treated chemically with an aquatic-safe herbicide each year until eradicated. Phragmites should be treated with a combination of glyphosate and imazapyr in the late summer or early fall, while other herbaceous invasive vegetation such as thistle, clover, dock, and burdock should be treated with glyphosate several times per year, ideally prior to seed formation.



2) *Small Pond* - A small pond is located at the entrance driveway to the Interpretive Center, along the north side of Hines Drive. This pond was dry during the 2012 assessment due to excessive heat coupled with historic drought conditions. Typically, it appears as though the ponded area features cattail, spikerush, and sedge within the basin, while willow, silver maple, and cottonwood buffer its edge. The only invasive species of note around this pond was thistle. Thistle is intolerant of wet conditions, so it is likely that this plant will not be present during a normal growing season.

Management Recommendation: If herbaceous non-native species persist or advance into this area in the future, they should be chemically treated with an aquatic-safe, glyphosate-based herbicide such as Rodeo® or AquaNeat®.



3) *Large Meadow* - Southeast of the Nankin Mills Interpretive Center lies a 3.4-acre meadow. This moderately-high quality feature contains a diverse assortment of native prairie species, including switchgrass, coreopsis, big bluestem, Indian grass, foxglove, and a variety of asters and goldenrods. Non-native thistle is common throughout the meadow, but is not abundant at this time. Woody species such as dogwood, sumac, cottonwood, ash, and box elder are present as well, but the site contains very little buckthorn or honeysuckle.



Management Recommendation: This portion of GZ-B was intended to serve as a meadow or prairie. Although it is very diverse and contains a significant number of higher quality plant species, woody species are prevalent and threaten to alter the overall vegetative composition. If left unmanaged, these woody species will continue to thrive and advance until this meadow evolves into a shrub-dominated field, and eventually into forest. In order to preserve the biotic integrity of the meadow habitat, Niswander Environmental recommends that this portion of Grow Zone B be burned every other spring. Furthermore, young trees and shrubs that survive should be eliminated using cut-stump techniques with a triclopyr-based herbicide such as Renovate[®], Garlon[®], or Pathfinder[®].

4) *Small Meadow* - A second, smaller meadow was created across Hines Drive from the Interpretive Center. This 1.1-acre meadow is somewhat similar to the larger meadow in that it is diverse and generally lacks the invasive species that are common within other Grow Zones. Thistle is again common throughout this section, as are undesirable but native woody species such as dogwood, sumac, and cottonwood saplings. Since this Grow Zone is adjacent to the Rouge River, this portion features more wetland species such as spikerush, willow, joe pye weed, and Indian hemp in addition to the other native prairie species.



Management Recommendation: Similar to the larger meadow, this meadow should be burned every other spring to discourage the growth of woody species. A prescribed burn will also eliminate non-native herbaceous cover such as thistle. Being within a floodplain, this area is particularly susceptible to an influx of non-native species whose seed is washed into the area from upstream locations; therefore, annual monitoring is also recommended.



GROW ZONE C – INKSTER ROAD (GZ-C)

Grow Zone C consists of two areas along Hines Drive, east of Inkster Road in Dearborn Heights; 1) a 1.1-acre meadow exists along a slope on the north side of Hines Drive, and 2) a smaller (0.40-acre) oxbow-shaped meadow is present further east, along the south side of Hines Drive.

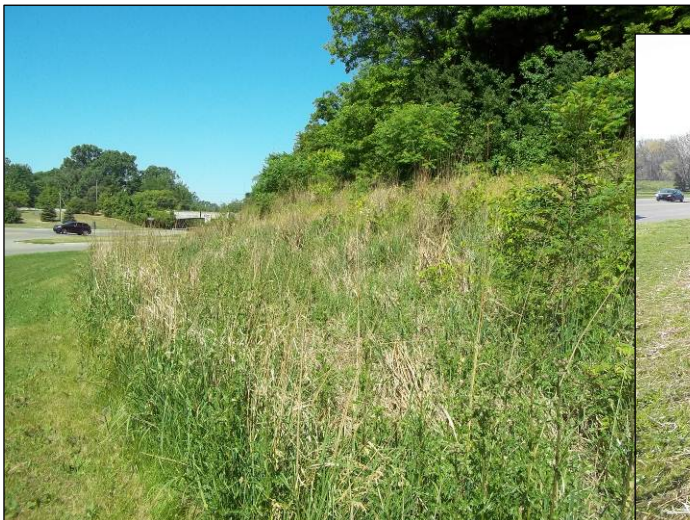
1) *North Meadow* - The 1.1-acre sloped portion was designed to be a prairie, but is reverting to scrubland or young forest. Native prairie species dominate this portion, but woody species such as cottonwood, sumac, and elm were also abundant during the assessments conducted in July 2012. Thistle is also prevalent within this area, but is not as much of a concern as the undesirable trees and shrubs.



Management Recommendation:

Niswander Environmental recommends this area be returned to a prairie community through prescribed burning. Subsequently, David Borneman, LLC conducted a controlled burn on this sloped portion of GZ-C in November 2012. Prior to the burn, Wayne County Parks brush-hogged the area, eliminating most of the woody species. The mowing and burn will likely be very successful, although it cannot be definitively determined until the spring of 2013. Should woody

species return (or non-native herbaceous plants), they should be chemically treated. The type of chemical, method of application, and timing is dependent on the species and density of the populations. In addition, Niswander Environmental recommends that this portion of GZ-C be burned every other spring and monitored on an annual basis.





2) *Southern Oxbow Meadow* - The oxbow-shaped meadow portion of GZ-C is densely vegetated and very diverse, especially considering that it is less than ½ acre in size. Milkweed, cup plant, ironweed, switchgrass, coneflower, big bluestem, bee balm, and a variety of native asters and goldenrods are prominently displayed throughout this section of Grow Zone C. Despite the abundance of native grasses and wildflowers, thistle is fairly common throughout, as is honeysuckle, Siberian elm, and multiflora rose. Additionally, this area contains a number of native woody species such as sumac, box elder, cottonwood, American elm, and mulberry. These species are native to Michigan, but were not intended to inhabit a meadow community. As such these are considered undesirable and corrective actions are warranted to remove them from this site.



Management Recommendation: The oxbow portion of GZ-C was burned by David Borneman, LLC in November 2012. However, due to this year's extended growing season, many of the non-native species were still green in November, and the burn likely did not eliminate all the undesirable vegetation. The success of the burn will be revealed in the spring of 2013. Regardless, Niswander Environmental recommends that the oxbow section be burned every other spring, with follow-up chemical treatment to hinder the establishment of woody species, both native and non-native. Herbaceous vegetation that may colonize this site should be spot treated using glyphosate and/or triclopyr, depending on the species and density. Annual monitoring of this and all Grow Zones is highly recommended.





GROW ZONE D – FORD ROAD (GZ-D)

Grow Zone D is the largest of the Grow Zones within the Middle Rouge corridor, and extends north and west from Ford Road, along the south side of Hines Drive in Dearborn Heights. This Grow Zone is approximately 5.3 acres in size and offers a variety of different habitat types, including meadow, successional field, wetland, and forested floodplain.



While some of the meadow habitat within Grow Zone D is open and flourishing as designed, many areas are transitioning into successional old field. Native prairie species are present, and even abundant, in many of the meadow areas, but woody species are rapidly advancing and will eventually displace the native grasses and wildflowers. In particular, cottonwood, buckthorn, and honeysuckle are becoming well-established within areas designed as meadow. In addition, invasive herbaceous species such as thistle, dock, teasel, and clover are common. Despite the amount of woody and/or non-native plants, the meadow portions of GZ-D are diverse and serve as an excellent natural buffer to the Rouge River located to the south.



Wetland habitat is common between the River and Grow Zone D, and extends into GZ-D in portions. Many of the planted native shrubs such as buttonbush (left), ninebark, and dogwood are healthy and expanding, but the wetlands themselves are generally of low quality from a vegetative perspective since they are dominated by invasives such as reed canary grass, Phragmites, and/or narrow leaf cattail. Although they are not particularly diverse, they still serve as an important buffer to the river, help manage floodwaters, and aid in pollution filtration.



The eastern portions of GZ-D include open meadow that transitions into forested floodplain habitat. Reed canary grass is abundant in areas adjacent to this section of the Grow Zone, but the Grow Zone itself contains only a few individual clumps that are easily managed. This area features native milkweeds and prairie grasses, and is generally quite diverse.



The eastern sections of GZ-D consist of a diverse open meadow. However, reed canary grass is abundant just beyond the limits of the Grow Zone, and will become an issue if left untreated.

Management Recommendation: Due to the size and different habitat types associated with GZ-D, a single management strategy cannot be recommended for each section. Niswander Environmental treated Phragmites, reed canary grass, and narrow-leaf cattail in wetland areas within and immediately adjacent to this Grow Zone in an attempt to prevent further encroachment. Annual chemical treatment is recommended to fully control these species. If the County desires to maintain Grow Zone D as a meadow community, Niswander Environmental recommends a mow and burn treatment cycle every spring for several years, with an eventual reduction to a simple burn every other spring. This should effectively discourage the growth of cottonwood, buckthorn, honeysuckle, and other woody species while significantly encouraging a native prairie community. Supplemental seeding and planting may be necessary in some portions of the Grow Zone where cottonwood and teasel have become dominant.



Meadow portions of GZ-D are becoming dominated by cottonwood and will continue to transition into successional old field if left untreated.



GROW ZONE 1 – WATERFORD BEND (GZ-1)

Grow Zone 1, located immediately north of Six Mile Road on the east side of Hines Drive, is a moderately low quality meadow that contains both native and non-native grasses and wildflowers. A majority of this site is comprised of various upland asters, goldenrods, and prairie species such as milkweed, little bluestem, switchgrass, black-eyed susan, and coneflower. Wet meadow plants such as sedge, rush, and cattail are common enough to suggest that this area is seasonally saturated. Teasel is the most abundant non-native species, and it is located throughout the site. Phragmites and reed canary grass are also present in pockets, albeit in small populations.



Management Recommendation: In accordance with Niswander Environmental's previous recommendations, Phragmites and reed canary grass were treated in the late summer of 2012, and David Borneman, LLC followed up with a prescribed burn in November 2012 to reduce the teasel population. Niswander Environmental recommends regular prescribed burns every spring until the teasel is eliminated (and every other spring thereafter), with annual monitoring and possible herbicide spot treatments to control emerging reed canary grass, Phragmites, and other non-native plants. A prescribed burn will effectively remove the invasive vegetation and kill their shallow root system while recycling nutrients and promoting growth of the native prairie species.



The small stand of Phragmites was treated in late summer and burned in November 2012.





GROW ZONE 2 – SIX MILE (GZ-2)

Grow Zone 2 (located immediately south of Six Mile Road) is comprised of two separate areas: 1) the meadow area on the east side of Hines Drive, and 2) the linear portion that extends south along the west side of the parkway.

1) *East Meadow* - The meadow portion of Grow Zone 2 is similar to GZ-1 in that it contains an abundance of aster, goldenrod, and prairie species in addition to thistle and teasel, which are common throughout this site. Areas along the woodline are densely vegetated with mature shrubs such as hawthorn and buckthorn, and seedling buckthorn (and other woody species) are present within twenty feet of the edge. Reed canary grass was observed in small numbers scattered throughout GZ-2.

Management Recommendation: Small patches of Phragmites and reed canary grass were chemically treated with glyphosate by Niswander Environmental in late summer 2012. Additionally, this section of GZ-2 was burned by David Borneman, LLC in November 2012. Due to the abundance of teasel, and the fact that prairie species are abundant, Niswander Environmental recommends that Grow Zone 2 receives a prescribed burn each spring for several years to remove the teasel, with annual spot treatments to ensure that non-native vegetation such as buckthorn, reed canary grass, thistle, and teasel do not re-establish. If non-native species colonize in the future, herbaceous plants can be spot-treated with a glyphosate- or triclopyr-based herbicide in the early spring and again mid-summer, while woody species should be hand-pulled or removed utilizing the cut-stump method between August and March. Most non-native woody species are shallow-rooted and easy to pull by hand as seedlings.



2) *West Meadow* - The portion of GZ-2 located along the west side of Hines Drive follows a steep slope south that expands to buffer a marsh. This long, linear buffer averages 5 to 15 feet in general, and features native grasses and shrubs along most of its length, although non-native species such as reed canary grass, Phragmites, purple loosestrife, burdock, Dame's rocket, buckthorn, and autumn olive are present in small areas. Most of the buffer consists of dense shrubs such as dogwood and viburnum, but buckthorn ranging in size from 5 to 20 feet in height is also common.



Management Recommendation: This particular segment of GZ-2 was not treated in 2012. Niswander Environmental recommends that this area be treated with herbicide starting in 2013 and continued for several growing seasons, depending on the type of vegetation. Herbaceous species other than Phragmites can be selectively spot treated with a glyphosate-based herbicide from April to first frost. It has been our experience that treating two to three times per season (*i.e.*, April, June, and/or August) proves to be most effective in controlling particularly stubborn species such as reed canary grass. Phragmites, however, should be treated with a glyphosate-based herbicide (with surfactant) in the fall (generally early to mid-September) for several years before adding an imazapyr-based chemical to the solution. Due to the size of the invasive shrubs, Niswander Environmental recommends utilizing the cut-stump method with triclopyr to control non-native woody vegetation such as buckthorn, autumn olive, and honeysuckle.



GROW ZONE 3 – SPRINGHILL (GZ-3)

Grow Zone 3 is a linear feature comprised primarily of meadow habitat. It directly abuts the Rouge River, and as such is prone to periodic flooding. A majority of the vegetation present within GZ-3 is comprised of native prairie species, and there are a number of seedling/sapling redbud, oak, and alder beginning to establish at the northern and southern end of the site. A few mature Norway maple and redbud are located in the northern sections.



Overall, GZ-3 is a moderately high quality area. Non-native vegetation is scattered throughout, but in relatively low populations. Young buckthorn, Chinese elm, and honeysuckle (3 feet in height on average) are congregated beneath the mature maples, amongst the alder, and along the edge of the woodlands in general, and several small patches of reed canary grass exist in the center of this Grow Zone. Burdock, thistle, and teasel are present as well, but in isolated numbers. Thistle was observed to be actively growing through November 2012.

Management Recommendation: Herbaceous species such as teasel, thistle, and reed canary grass were chemically treated by Niswander Environmental in the summer and fall of 2012. In addition, Niswander Environmental removed woody species (primarily buckthorn) in October 2012 using the cut-stump method, which involves cutting the shrub at its base and applying a triclopyr-based herbicide such as Garlon 3A[®] or Renovate[®]. Due to the fact that a majority of GZ-3 is dominated by native vegetation, and the fact that a number of seedling oak, redbud, and alder are beginning to establish, Niswander Environmental recommends that the invasive woody species such as buckthorn and honeysuckle be removed using the cut-stump method. In addition, invasive herbaceous vegetation should be chemically treated several times during the growing season with a glyphosate-based herbicide such as RoundUp Pro[®], Ranger Pro[®], Rodeo[®], or AquaNeat[®]. Please note that a surfactant such as Cygnet Plus should be combined with Rodeo[®] or AquaNeat[®] at the recommended solution.



Honeysuckle is abundant at the base of the mature trees in GZ-3.





GROW ZONE 4 – PARKVIEW (GZ-4)

Grow Zone 4 is a small meadow that contains an abundance of native prairie species. There are several small oaks that provide limited shade to this Grow Zone. Most of the area lacks invasive vegetation; however, young buckthorn and honeysuckle occur under the oaks, while a considerable amount of mature buckthorn is present along the woodline. Small pockets of clover are scattered throughout, but it has not yet out-competed other species. Overall, Grow Zone 4 is of moderate quality for its small size due to the native species present and lack of invasive vegetation.



Management Recommendation: As previously recommended, Niswander Environmental spot treated thistle and emerging buckthorn in summer 2012, and returned later in the fall to remove mature buckthorn and honeysuckle via the cut-stump method. Because this area is very small, Niswander Environmental recommends that the invasive woody species be removed regularly using the cut-stump method with a triclopyr-based herbicide. Most of the buckthorn and honeysuckle are less than three feet tall, and the younger buckthorn may even be hand-pulled. The larger plants along the woodline can also be removed by volunteers using this control method. Herbaceous species such as clover and thistle should be spot sprayed annually with a glyphosate-based chemical. A prescribed burn would benefit the native prairie species growing here, but this area is very small and most of the invasive vegetation is currently under control following the chemical applications. Regardless, this area could be burned every few years to promote a healthy meadow community.



GROW ZONE 5 – NEWBURGH POINTE (GZ-5)

Grow Zone 5 is a 0.50-acre area along the north side of Hines Drive, across from Newburgh Lake. GZ-5 consists of two small restored areas separated by mowed turfgrass. This Grow Zone has been planted and seeded with native prairie species, but also contains spotted knapweed and an abundance of non-native honeysuckle and buckthorn ranging in size from two to six feet. The largest and most dense collection of these invasive shrubs exists amongst several large, mature oak trees in the eastern section of the Grow Zone.



Management Recommendation: As Niswander Environmental previously recommended, spotted knapweed and emerging young honeysuckle were foliar treated in the summer of 2012 with Renovate[®], a triclopyr-based herbicide. Typically, woody species respond best to cut-stump treatments. However, due to the fact many honeysuckle were small in stature, it was believed that the foliar treatment with triclopyr could be effective. Shrubs that received more sunlight appeared to be affected more than those sheltered by the large oaks, however. As a result, the honeysuckle and buckthorn were removed later in the fall via the cut-stump method, which proved effective. In the future, Niswander Environmental recommends removing emerging buckthorn and using this cut-stump method with a triclopyr-based herbicide such as Garlon 3A[®] or Renovate[®]. Smaller seedlings of these species can be removed by hand. When the cut-stump method is utilized, please be aware that it must be done in the late summer, fall, or winter, when sap is not actively moving up the stems.



Spotted knapweed is an aggressive forb that reproduces rapidly by seed and produces a chemical that is toxic to other plants, which allows it to displace native species. This species is best controlled in the spring or early summer by selectively spot spraying a triclopyr-based herbicide (*i.e.*, Garlon 3A[®]) while the plants are from the rosette to the budding stage of growth. Once plants reach the flowering stage or later they must be hand-pulled. Annual spraying is necessary until spotted knapweed seed is no longer viable. This may require several years of annual treatment. Additionally, GZ-5 would benefit from a regular prescribed burn cycle.



GROW ZONE 6 – SUMAC POINTE (GZ-6)

Grow Zone 6 is a large, moderately high quality meadow located along the north side of Hines Drive, also across the road from Newburgh Lake. This 1.1-acre Grow Zone is very diverse and features an array of native prairie species such as foxglove, coreopsis, sunflower, coneflower, big bluestem, Indian grass, and switchgrass, among others. This area slopes towards Hines Drive, is very dry, and does not appear to receive floodwater. Despite the abundance and variety of native plants, non-native species are also plentiful. Buckthorn, honeysuckle, and Siberian elm are present in small clusters, particularly in the understory of mature trees. Additionally, invasive species such as spotted knapweed, clover, thistle, teasel, and Phragmites are scattered throughout.



Management Recommendation: Although there was a significant amount of invasive vegetation present, most were isolated plants or small clusters, which are challenging to locate and therefore difficult to effectively treat. As a result, Niswander Environmental recommended a prescribed burn at GZ-6, which was completed by David Borneman, LLC in November 2012. The burn will not only suppress the non-native herbaceous species and undesirable woody vegetation, but will also maintain the prairie community and enrich the soil. Niswander Environmental recommends that this Grow Zone be burned every other year in the spring to maintain its high quality and diverse nature.





GROW ZONE 7 – NEWBURGH DAM (GZ-7)

Situated between Hines Drive, Plymouth Road, and Newburgh Road lies Grow Zone 7, a 0.63-acre meadow containing a variety of upland prairie species. GZ-7 is of moderate quality and is fairly diverse; common species observed within this area include mint, coreopsis, switchgrass, coneflower, Indian grass, and wild rye. Randomly scattered amongst the native prairie species, however, is a collection of thistle and non-native shrubs. Honeysuckle and buckthorn dominate the eastern edge of this area, just beyond the Grow Zone limits. As such, these species have begun to advance into the Grow Zone.

Management Recommendation: Niswander Environmental previously recommended and carried out cut-stump treatments in October 2012. Most of the non-native woody species were less than 3 feet in height when they were cut and treated. As is required with cut-stump techniques, a triclopyr-based herbicide was administered to freshly cut stems. Herbaceous species (primarily spotted knapweed and thistle) and seedling honeysuckle were foliar treated with triclopyr in July 2012, and again in October 2012. Similar to other newly created Grow Zones, isolated young shrub seedlings (less than 12”) are difficult to locate in densely vegetated meadow areas, and can be inadvertently left untreated. Therefore, Niswander Environmental recommends that GZ-7 be burned every other year in the spring, and spotted treated with herbicide in off years to prevent invasive vegetation from advancing from adjacent areas.





GROW ZONE 8A – PLYMOUTH AND ANN ARBOR ROADS (GZ-8A)

Grow Zone 8a is a 1.26-acre area bound by Hines Drive, Ann Arbor Road, and Plymouth Road. This highly visible area is relatively diverse and similar to other nearby Grow Zones in that it contains many high quality native prairie species, including coreopsis, mint, cordgrass, coneflower, bluestem grasses, Indian grass, sunflower, black-eyed susan, and bee balm. Also similar, however, is that it contains invasive vegetation. Spotted knapweed and mullein are prevalent in many areas of GZ-8a, as is honeysuckle. Most of the honeysuckle is approximately 3'-6' in height, and resides under mature trees and along the perimeter. Areas along Plymouth Road to the north are particularly infested with larger, dense stands of honeysuckle.



Management Recommendation: As previously recommended by Niswander Environmental, Grow Zone 8a was burned by David Borneman, LLC in November 2012 to reduce the amount of young honeysuckle, spotted knapweed, and mullein. Spotted knapweed in particular is difficult to eradicate after a single event when burned in the fall. Fall burns are effective, but fresh rosettes tend to prevent the entire plant from burning; spring burns offer better success rates since more fuel is present. As such, Niswander Environmental recommends that GZ-8a be burned regularly every other spring, with follow-up herbicide spot treatment to herbaceous sprouts several weeks following the burn. If hardier or more mature woody species remain, these should be removed using standard cut-stump techniques in the late summer, fall, or winter.





GROW ZONE 8B – LEVAN KNOLL (GZ-8B)

Levan Knoll is a small (0.38-acre), moderate-quality meadow located between the Rouge River and Hines Drive in Livonia. Much of this Grow Zone is dominated by native prairie grasses and a variety of milkweeds, asters, and goldenrods. Being in the floodplain of the river, several pockets of wet meadow are present, but a majority of this Grow Zone is considered upland or mesic. Non-native shrubs such as buckthorn, honeysuckle, autumn olive, catalpa, and multiflora rose are present throughout this area, and thistle is present as well in small numbers. Most of the non-native shrubs within the Grow Zone are relatively small (less than 5' tall), but mature honeysuckle and buckthorn dominate the wooded perimeter.



Management Recommendation: Niswander Environmental previously recommended that the abundance of non-native shrubs in Grow Zone 8b required control through a prescribed burn. David Borneman, LLC conducted the successful burn in November 2012. In addition to the invasive shrubs, other woody species such as cottonwood were eliminated to enhance the meadow community. Niswander Environmental recommends that GZ-8b be burned every other spring, with follow-up herbicide treatments to prevent invasive species from establishing. The chemical and exact technique will be dependent upon which species survive the burns, and thus monitoring should be completed prior to herbicide treatments.



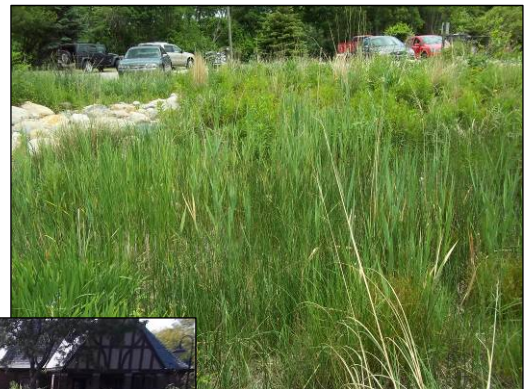


RAIN GARDEN 1 – NEWBURGH POINTE (RG-1)

The raingarden area at Newburgh Pointe is small and primarily vegetated with wetland species such as sedge, spikerush, bulrush, prairie cordgrass, and other native species. However, Phragmites is also present within the basin, and thistle is present along the edges. This feature appears to effectively filter pollutants from Hines Drive, the parking lot, and surrounding areas before discharging excess stormwater into Newburgh Lake.

Management Recommendation: Phragmites and thistle are the two primary invasive plants within RG-1, and both should be treated with an aquatic-safe, glyphosate-based herbicide such as Rodeo® or AquaNeat® (along with a surfactant). The thistle should be treated anytime from mid-spring to mid-summer prior to setting seed, and spot treated annually if necessary. The Phragmites should be spot treated annually in the fall for several years, and may require a transition to an imazapyr-based formula (i.e., Habitat®) after several consecutive years of treatment using glyphosate. Please be advised that this area may require a Part 33 Aquatic Nuisance Control Permit from the MDEQ to treat if standing water is present within the raingarden.

Niswander Environmental also recommends supplemental plantings with native grasses and wildflowers since this area is located in highly visible locations. Sedge, bulrush, and prairie cordgrass are currently prevalent, but showy wildflowers such as swamp milkweed, New England Aster, boneset, joe-pye weed, sneezeweed, cut-leaf coneflower, bushy aster, and blue lobelia could be planted around the perimeter once the thistle is eradicated. The wildflowers will enhance the area visually throughout the spring, summer, and fall and are attractive to butterflies and hummingbirds. The above mentioned species can be installed as seed or plugs (or both), depending on preference (i.e., wild vs. formal landscape) and cost parameters (i.e., plugs are more costly). In more publicly visible areas, Niswander Environmental recommends that plugs be used since they add immediate results.





RAIN GARDEN 2 – VALLEY VIEW (RG-2)

Rain Garden 2 is a very small basin (<0.1 ac) located along Valley View Park Drive and Hines Drive in Westland. In its current state, RG-2 is a depressional mudflat, generally void of vegetation that does not presently function as a rain garden. The rain garden was designed to receive stormwater from Hines Drive and eventually discharge into the adjacent Middle Branch of the Rouge River. Although the basin was heavily seeded and planted with a variety of native plugs (over 800 plants), it has failed to establish. The perimeter, which is mowed to within three feet of the basin, consists of asters, goldenrods, and a few prairie grasses. The only invasive vegetation of note was a clump of reed canary grass and a small population of moneywort along the edge.



Management Recommendation:

After several attempts by Wayne County, it appears as though this area does not offer ideal conditions for a successful raingarden, at least in its current state. Reasons for failure to establish could include unsuitable soils, flash flooding, improper planting techniques, improper plant selection, and/or pollution (i.e., road salt, petroleum, gas, etc.). Niswander Environmental recommends that the basin and its edge be chemically treated with glyphosate to eradicate the small clumps of reed canary grass and moneywort. The presence of moneywort suggests that this basin is wet for prolonged periods of time. Therefore, supplemental seeding and planting should include vegetation that is tolerant to prolonged inundation and flash flooding as well as tolerant to salt and other common road pollutants. Such species include river bulrush, bristly sedge, prairie cordgrass, soft-stemmed bulrush, nodding bur-marigold, arrowhead, and water parsnip. Showy species such as boneset, false aster, false dragonhead, bristly aster, and golden Alexander are appropriate as edge species, along with sedges, rush, spikerush, and switchgrass.





UPPER ROUGE GROW ZONES

GROW ZONE 1 – WEST OF KINLOCH STREAMSIDE (GZ –1)

Grow Zone 1 within the Upper Rouge Watershed is located in a residential neighborhood within the Lola Valley Park in Redford. This area is approximately one acre in size and consists primarily of meadow habitat, although an area of willow extends along the banks of the Upper Branch of the Rouge River. The meadow is fairly diverse and is of moderate quality, dominated by native prairie grasses. Thistle, curly dock, timothy, and reed canary grass are scattered throughout the meadow, but not yet to the point where they pose a significant threat to this Grow Zone. In addition, cottonwood ranging in size from 4' – 8' in height is rapidly establishing and threatening the integrity of this meadow community type.



Management Recommendation: Grow Zone 1 was not actively managed in 2012. Niswander Environmental recommends that GZ-1 be burned every other spring to maintain the meadow community as designed. Burning this site will discourage the further establishment of cool season grass along with cottonwood and other woody species, while promoting the native prairie species.

In addition, regular prescribed fires will reduce the potential for wildfires through preventing the buildup of fuel in the meadow, which is important considering this Grow Zone is located in a residential area. Each Grow Zone should be monitored annually to ensure that exotic species are not spreading. Chemical spot treatments may be required in between burns to prevent non-native vegetation from colonizing.





LOLA VALLEY

The Lola Valley Grow Zone, which was constructed in 2012, is a large Grow Zone that follows the Upper Branch of the Rouge as it flows through a residential neighborhood in Redford Township. This Grow Zone was separated into three distinct Areas on the south side of Lola Drive; Areas 1 and 2 are small and located west of Beech Daly Road while Area 3 is a linear feature that is situated between Beech Daly and Garfield Road.

1) *Area 1* – Area 1, located on the south banks of the river east side of Kinloch Road, was designed to be a mesic meadow, indicating that it receives periodic floodwaters from the adjacent river. Although the area has been seeded, very few plants have actually germinated thus far. The perimeter of Area 1 contains an abundance of common buckthorn and some honeysuckle, but these have yet to spread into the Grow Zone itself. A second, smaller section of Area 1 lies along a slope on the north side of the Rouge. This area has been mowed, but it appears as though native species have established.



The larger portion of Area 1 has yet to germinate.



The sloped section of Area 1 is smaller, and has been mowed

Management Recommendation: Niswander Environmental recommends that Area 1 be monitored throughout 2013, which would be its second growing season. If species within the seed mixes fail to germinate, supplemental seeding and planting may be necessary. If non-native species begin to establish, they should be hand-pulled or treated chemically before they become an issue. If left unattended, buckthorn and honeysuckle could rapidly encroach into this Grow Zone. Should this occur, regular prescribed burns would be recommended every other spring.

2) *Area 2* - Area 2 also features two sections, separated by Beech Daly Road. Both are very small (less than 0.15 ac) and are located on the north side of the Upper Branch of the Rouge River. Both sections currently consist of mowed turfgrass, but mature stands of common buckthorn are present in the immediate adjacent areas.



Management Recommendation: Since Area 2 had been mowed at the time of Niswander Environmental's assessment, it is difficult to provide a specific long-term maintenance recommendation. However, with the amount of buckthorn present nearby, there is great potential that this species will eventually advance into Area 2. Management options include herbicide treatment and/or hand-pulling (if conducted early), cut-stump treatments (if plants are left to establish), or periodic prescribed burns.



3) *Area 3* - Area 3 extends along both banks of the Rouge River, from Beech Daly east to Garfield Road. This linear feature lies at the bottom of a slope and will serve as an important natural buffer to the river. Similar to Area 1, this portion of the Lola Valley Park Grow Zone has very few plants that have germinated, including the temporary grasses intended to act as a cover crop. This section of the Grow Zone does not extend to the immediate banks of the river, but was designed to intermix with the existing vegetation that currently exists along the river's edge. Unfortunately, much of the existing vegetation is reed canary grass. Native grasses and forbs are present as well, but the abundance of reed canary grass suggests that it will likely invade the Grow Zone unless it is proactively treated.



Management Recommendation: Niswander Environmental recommends that the banks of the Upper Branch of the Rouge be chemically treated with a glyphosate-based herbicide several times in 2013 to prevent reed canary grass from spreading into the limits of the Grow Zone. In addition, any woody species that are present, including buckthorn and honeysuckle, should be removed via cut-stump techniques. Long term maintenance of this Grow Zone should include supplemental seeding and planting if species from the seed mixes fail to establish. Once established, a prescribed burn every other spring to promote the native meadow plants is recommended.

In addition to management strategies to discourage unwanted vegetation, other actions could be taken to restore the banks of the Upper Branch. The banks of the Rouge in this section lack vegetation in many areas, and generally lack overhanging trees and shrubs. As a result, there are a number of areas that are already eroding into the river, and several more where sheer erosion will eventually claim a few mature trees. Effective bank stabilization could be achieved through a number of best management practices, including the installation of willow stakes or bundles, natural coir logs, or stone, among others. In addition, buckthorn currently present could be removed and replaced with willows, dogwood, or other native shrubs to aid in stabilization while providing cover and much-needed shade to the river. Mowing to the edge of the river should also be prohibited, and ideally a 25-foot native vegetative buffer should be maintained.



LOWER ROUGE GROW ZONES

VENOY PARK

Venoy Park is located on the north side of Lower Rouge Parkway, east of Venoy Road in Westland, Michigan. This Grow Zone sits above the river valley and overlooks athletic fields associated with Wayne County Parks. The Grow Zone was mowed prior to Niswander Environmental's on-site assessment, but appears to consist of a variety of grasses and forbs, many of which are non-native but not necessarily invasive. The southeastern portion of this area is nestled between a residential subdivision and forested habitat that buffers the Lower Rouge River. The forested area in this section is generally healthy and lacks an abundance of non-native vegetation, so it is likely that the Grow Zone in this section will not contain invasive shrubs within the immediate future. The northern sloped portions of this Grow Zone are located along the south side of Dorsey Road, and also abut single family homes. A strip of forest that extends into the mowed Grow Zone area is cause for concern, however, due to the amount of invasive vegetation, which includes buckthorn, honeysuckle, European privet, multiflora rose, burdock, and garlic mustard. These species advance rapidly into newly established areas, especially garlic mustard.



Southeast corner of Venoy Park Grow Zone



Sloped portion, south side of Dorsey Road



Northwestern edge of the Grow Zone in 2012

Management Recommendation: Portions of the Grow Zone immediately surrounding the woodland are susceptible to the invasive species listed above. Niswander Environmental recommends that this site be monitored closely with stewardship likely required several times per year for several years if warranted. Variables such as species type, height and density, climatic conditions, and time of year will determine the best management options. It is anticipated that buckthorn and honeysuckle will eventually populate the areas around the northernmost wooded extension; as such, these species should be hand pulled if young, or treated with a triclopyr-based herbicide in the late summer, fall, or winter. Garlic mustard, if present, should be hand pulled in the spring and early summer, prior to setting seed. Niswander Environmental further recommends that invasive vegetation with the woodlot along the west side of the athletic fields be cleared annually to lessen the risk of encountering these species in the Grow Zone. Once a healthy plant community has fully established, periodic controlled burns will help hinder any encroachment of the non-native plants.



A wooded finger extends into the northern sections of the Grow Zone along Dorsey Road. This woodlot contains an abundance of non-native shrubs that could become a significant management issue if annual stewardship is neglected.





INKSTER ROAD CSO

The proposed Inkster Road Grow Zone is a 2.6-acre open space area located on the south side of Lower Rouge Parkway, east of Inkster Road. This park was recently mowed at the time of inspection in November 2012, making it difficult to determine what species are present and what actions need to be taken. Much of the mowed area consists of upland grasses, but also contained forbs such as plantain, thistle, aster, goldenrod, mullein, and Queen Anne's lace.



View facing south of the western half of the Inkster Road Grow Zone



View facing east of the eastern half of the Grow Zone

Management Recommendation: Once the Grow Zone is left to develop, a more accurate assessment can be provided. The entire southern perimeter of this Grow Zone, however, consists of non-native honeysuckle which will likely require annual maintenance to control. In order to discourage the need for continual management, Niswander Environmental highly recommends that the perimeter stand of honeysuckle be removed via prescribed burn and/or cut-and-treat methods as soon as possible. Since this stand of honeysuckle extends into wooded areas, the success of a prescribed burn will depend on several factors, including the amount of fuel present, types of trees in the adjacent forested areas, and climatic conditions. If an effective burn to reduce the perimeter honeysuckle cannot be accomplished, it is likely that annual herbicide treatment and/or prescribed burns within the Grow Zone will be necessary each year to prevent this invasive shrub from dominating the restored areas.



A dense stand of mature honeysuckle is present along much of the perimeter of the Inkster Road CSO Grow Zone.



COMMERCE COURT

The Commerce Court Grow Zone is a small wet meadow located behind the Wayne County Department of Public Services building in Wayne, Michigan. Despite the fact that this area is less than 0.50 acres in size, it adjoins the Lower Rouge River and provides important functions and values such as stormwater retention, groundwater recharge, flood control, nutrient filtration, and wildlife habitat. This Grow Zone primarily consists of wet meadow habitat and is dominated by native meadow species such as sedge, rush, mint, bulrush, aster, coneflower, and black-eyed susan. This area generally lacks invasive vegetation other than a few small honeysuckle surrounding a narrow walkway and a few reed canary grass and thistle plants along the perimeter.



Management Recommendations:

The Commerce Court Grow Zone is a low priority as it pertains to invasive species management. This Grow Zone is fairly small, is not located in a highly visible area as the other Grow Zone sites, is functioning as designed, and contains relatively few invasive species. Niswander Environmental recommends that the honeysuckle be removed via cut-stump method before they grow and expand further into the site, and the reed canary grass and thistle should be treated chemically with a glyphosate-based herbicide. Once that is accomplished, this Grow Zone should be monitored annually in order to ensure that other invasive species do

not enter the area and become established. Periodic spring burns (every few years) will aid in enriching the soil and encouraging growth of the native species.



A vast majority of the Commerce Court Grow Zone consists of native meadow species



A few small honeysuckle shrubs are present along a walking path.



III. SUMMARY AND LONG-TERM INVASIVE SPECIES MANAGEMENT STRATEGY

In 2012, Niswander Environmental assessed twenty (20) Grow Zone sites (including 2 raingardens) within the Upper, Lower, and Middle Rouge River watersheds that were created by Wayne County through a Great Lakes Restoration Initiative Program Grant. The purpose of the grant was to identify potential restoration activities for each of the 20 sites, to provide a short- and long-term management strategy, to prioritize the sites, and to restore at least 10 acres of habitat through invasive species control.

Most of the Grow Zones associated with this project were designed and constructed to be open meadow or prairie, and most were of moderate quality. Due to the fact that each site contained invasive vegetation, different strategies to combat the aggressive nature of these species were recommended to the County in a July 2012 short-term management report, and in many cases these were implemented in the summer and fall of 2012. In the July 2012 report, Niswander Environmental recommended 13 priority sites for immediate restoration as part of the Transforming the Rouge GLRI grant. The 13 sites listed in Table 1 on Page 3 were selected based on cost efficiency, visibility, and potential for success. In total, 11.1 acres of Grow Zone habitat were restored through the use of herbicide, prescribed fire, or a combination of both. The exact technique varied with each site, depending on the target species, population density, climatic conditions, surrounding land use, and accessibility. In general, non-native herbaceous species and young woody saplings were chemically treated by Niswander Environmental using a foliar broadcast method, while more mature woody plants such as buckthorn or honeysuckle were removed via a cut-and-treat (cut-stump) technique. Prescribed burns, conducted at seven Grow Zones by David Borneman, LLC, were typically utilized in open areas that featured an abundance of herbaceous and woody invasive or non-desirable vegetation.

Proper maintenance of a newly restored area is crucial to ensure its longevity, and a long-term management approach is needed to preserve the biotic integrity of the 20 Grow Zones. This requires annual site inspections to determine which maintenance strategies are necessary for that particular year, if any. It is difficult to predict which management options will be suitable for any given year, but it is anticipated that each site would benefit from annual maintenance. In years following a burn, spot treatments using herbicide are expected to be minimal, and may not be necessary in some cases. If several years pass without active management, however, a site could require extensive herbicide treatments, a controlled burn, mowing, and/or supplemental planting.

Common practices for meadow/prairie establishment call for annual mowing each spring for the first three years of their existence. This promotes the native grasses and wildflowers while discouraging the establishment of non-native, cool-season species. Most of the Grow Zones were fully established by 2012, and many already exhibited considerable diversity. However, newly created Grow Zones (such as Venoy Road, Inkster Road CSO, and Lola Valley) should be mowed at a height of six inches at least twice in the spring for several years. In addition, a regular rotational maintenance plan should be implemented for each site.

If followed correctly, the recommended maintenance plan represented in Table 5 below should result in successful Grow Zones that lack significant invasive vegetation within 3-5 years.



Table 5. Long-Term Management Strategy (2013 – 2017)

Grow Zone	2012 Treatment	Long-Term Management Strategy				
		2013	2014	2015	2016	2017
<i>Middle Rouge</i>						
GZ-A (Bennett)	H, B	H	B	H	B	H
GZ-B (Nankin)	-	B	H	B	H	B
GZ-C (Inkster Road)	M, B	H	B	H	B	H
GZ-D (Ford Road)	H	H, M, B	H, M, B	H, B	H	H, B
GZ-1 (Waterford Bend)	H, B	H, B	H, B	H, B	H	H, B
GZ-2 (Six Mile Road)	B	H, B	H, B	H	H	H, B
GZ-3 (Spring Hill)*	H	H	H	H	H	B
GZ-4 (Parkview)	H	B	H	B	H	B
GZ-5 (Newburgh Pointe)	H	H, B	H	B	H	B
GZ-6 (Sumac Pointe)	B	H	B	H	B	H
GZ-7 (Newburgh Dam)	H	B	H	B	H	B
GZ-8a (Plymouth and Ann Arbor)	B	H	B	H	B	H
GZ-8b (Levan Knoll)	B	H	B	H	B	H
RG-1 (Newburgh Pointe)	H	H, S	H	H	H	H
RG-2 (Valley View)	-	H, S	H	H	H	H
<i>Upper Rouge</i>						
GZ-1 (West of Kinloch Streamside)	-	H, B	H	B	H	B
Lola Valley	-	M, H , S	M, H	B	H	B
<i>Lower Rouge</i>						
Venoy Road	M	M, B	M, H	B	H	B
Inkster Road CSO	M	M, B	M, H	B	H	B
Commerce Court	-	H	B	H	B	H

* Burn not recommended at GZ-3 until 2017 due to amount of sapling redbud and speckled alder

H = herbicide

B = burn

M = mow/mechanical removal

S = supplemental seeding/planting

Annual costs associated with this long-term management strategy will vary from year to year. Niswander Environmental recommends a budget of \$1,500.00 per year for site assessments, and an annual budget ranging between \$8,000.00 - \$12,000.00 for prescribed burns and/or herbicide treatment. Sites will have to be prioritized following the assessment since it is unlikely that each of the 20 sites could be managed each year. The management plan listed above suggests 8-10 prescribed burns each year, with an average of 15 Grow Zones receiving herbicide spot treatments annually.

Implementation of this recommended management strategy will result in high quality natural areas that will provide valuable wildlife habitat, water quality benefits, visual buffers, and air quality improvements.