Oakland Township
Stony Creek Ravine Nature Park Expansion
Michigan Natural Resources Trust Fund
2015 Acquisition Grant Application
March 11, 2015

Application Narrative

A. PROJECT DESCRIPTION

This grant application is by the Oakland Township Parks and Recreation Commission for the 209-acre expansion of Stony Creek Ravine Nature Park, in Section 25, located east of Sheldon Road and north of Snell Road. The property is vacant and contains no existing structures or improvements.

The Stony Creek Ravine Nature Park Expansion offers resource restoration, protection and recreation opportunities within its additional 209 acres as well as through its connections to other natural habitats and recreation areas. See the Preliminary Site Development Plan. The project area will service the second most densely populated area of Oakland Township (Map 3, 2015 - 2019 Master Plan) and is within walking distance of Stony Creek Metropark, which serves over 1,500,000 visitors annually, Knob Creek Subdivision to the northwest and an adjacent subdivision in Macomb County. One public and two private schools are also located within one mile of the site.

Proposed recreation facilities (including a park entry road, 30-space parking lot, trail head, play structure, and potential active recreation area) are to be located in open agricultural fields in the southwest section of the project site keeping a minimum 400' buffer between them and adjacent residential land uses. An existing 24' tall hill in the middle of the site could provide winter sledding opportunities, which are much desired by Township residents. The proposed 2.32-mile multi-use trail system (hiking, bicycling, horseback riding) will connect internally to the existing .54 miles of park trails that overlook Stony Creek and will provide a nature trail loop that will parallel the edge of wooded and wetland areas, providing viewing and interpretation opportunities.

In fall 2015 three <u>proposed</u> wetland restoration basins will be constructed; restoring 50 acres of poorly drained farm fields to a combination of marsh, forested and shrub wetlands. The <u>existing</u> wetlands and high quality forests, totaling 50 acres, will be protected and stewarded. Any remaining agricultural fields would be converted to native vegetation in phases. If this park land acquisition is completed in 2016, OTPRC intends to apply for supplemental funding in 2019 to construct the proposed access and recreation improvements in 2021.

The additional ½ mile of Snell Road frontage where the park entrance sign and entry road will be located increases this park's visibility and ease of location exponentially. In the proposed 2015 OTPR signage master plan a way-finding sign will be proposed along Rochester Road, a state trunk line, at the intersection with Snell Road to guide people to the new entrance.

External trail connections, featured on the attached Oakland County Trail Network and Oakland Township Pathways maps, include proposed southern connections to the safety path along Snell Road and the Stony Creek Metropark trail system, and a proposed northern connection to the safety path along Gunn Road. The Stony Creek Ravine Nature Park Expansion trail could provide a hiking/biking connection to Stony Creek Metropark just north of the West Branch Picnic area. Trail users would be able to connect to the existing 14-mile Metropark trail system which weaves through unique and diverse ecosystems or continue on to the 8.30-mile paved hike/bike trail which circles around the park. This paved trail system then leaves the Park and could connect to the Macomb Orchard Trail on the southeast side.

The proposed recreation and conservation use of the project site will better protect it's habitats and wildlife than developing the site for residential use, which could result in clearing of forest areas, significant earth-moving, and disturbance of the ground cover which could result in erosion, potential siltation of Stony Creek and introduction of invasive plants.

B. PROJECT JUSTIFICATION AND SUPPORT

1. Need for the Project

a. Need as Documented in the Community Recreation Plan

The 2015 – 2019 Oakland Township Parks, Recreation and Land Preservation Master Plan lists as the first Strategic Master Plan recommendation under the Land Acquisition heading (p. 87): "purchase additional property next to Stony Creek Ravine Nature Park along Snell Road". This proposed acquisition also addresses three of the remaining four strategic land acquisition recommendations including protection of sensitive habitats, protecting natural areas adjacent to existing parks and acquiring land for trails.

Under Facilities and Natural Areas Stewardship headings, strategic recommendations that support this project include "Continue to focus on connectivity of external and internal trails to connect facilities, restoration of natural areas, and farm field re-vegetation efforts (removing drain tile to restore hydrology and convert to native plant community).

The 2010 Oakland Township Trails and Pathways Master Plan (Appendix A) shows the proposed trail connection between Stony Creek Ravine Nature Park and Stony Creek Metropark. The 2014 opinion survey of Township residents (Appendix B) indicated their continuing desire to acquire and steward new natural areas, to enhance and expand walking and biking trails, and to have more convenient access to parks and facilities through access paths and expanded parking. The Stony Creek Ravine Nature Park Inventory Table and Concept Plan (Appendices C and D) describe the community's desire to acquire adjacent property for better park access and trail connectivity.

Expecting to submit this grant application in 2015, the 5-Year Capital Improvement Plan devoted significant funding for completion of this land acquisition project in 2016 (p.89).

b. Need for the Project in Relationship to Existing Facilities (including State, local and private sector providers)

The attached maps for the Oakland Township Natural Areas Survey, Michigan Natural Features Inventory (MNFI) Natural Areas, and Oakland County's Green Infrastructure indicate that the 209 acres is a high priority for natural area preservation by Oakland Township and other local and regional organizations. Stony Creek Ravine Nature Park (SCRNP) East Addition Natural Communities map illustrates how the expansion of Stony Creek Ravine Nature Park will protect the headwaters of Stony Creek tributaries as the topography dramatically drops 100 feet in elevation from the northwest to southeast corners. The majority of the Stony Creek and its feeder streams flow through privately owned lands, presenting a number of challenges for riparian landowner stewardship, watershed management, and natural features protection. This project offers a unique opportunity to protect highly valued plant and wildlife habitats both on this parcel as well as downstream.

This project includes a MNFI Priority 2 Natural Area and is a key link in the attached Oakland County Green Infrastructure Map. It is identified as a "Site" which can serve as origin or destination for native wildlife and as a "Link" which facilitates movement between "Sites" and "Hubs" (larger sites), such as that between the natural areas of Stony Creek Metropark and Stony Creek Ravine Nature Park**.**

Since the original acquisition of SCRNP, Oakland Township Parks and Recreation has been attempting to provide improved access to this park. SCRNP's 16' of frontage on Snell Road may have been adequate for a trail connection but did not provide visibility for the park or area for a park entry road and parking lot. The 209-acre expansion will provide more than 2000 linear feet of frontage on Snell Road, a major east-west collector road, as well as area for the appropriate siting of a park entry road, parking lot, and trail head.

The provision of a north-south-oriented trail corridor across this parcel also provides a unique opportunity to complete the majority of a trail connection between Stony Creek Metropark trails and proposed safety paths along Snell and Gunn Roads. This new

connection would help meet the need for a northerly trail connection across Oakland Township as well as between three regional recreation facilities: the Paint Creek Trailway, Stony Creek Metropark and the Macomb Orchard Trail. The result of the 2014 Oakland Township Parks, Recreation and Land Preservation community opinion survey shows that additional recreational trail connections and opportunities are of the highest priority to local residents. This new trail connection would meet the needs of both local and regional trail users.

2. Collaboration on Proposed Park Operations

OTPRC is in the process of drafting a partnership agreement with Dinosaur Hill Nature Preserve, a non-profit organization that was founded 35 years ago, for the dual purpose of providing community nature education enrichment and field trips for school groups. OTPRC currently contracts with DHNP to provide nature programming and lead field trips at OT parks for second and third grade students of Rochester Community Schools. It is our expectation that DHNP will be responsible for the operation and management of all OTPRC environmental education facilities and programming in the future, including the expansion of Stony Creek Ravine Nature Park. Please see the attached DHNP letter of intent and the current OTPRC nature program offerings. Also find attached examples of our natural area stewardship, kayaking, fitness and archery program descriptions.

Four proposed programs descriptions have been created specifically for this park. Please refer to these program attachments that range from an interpretation of the glacial history and its associated hilly topography to the observation and explanation of the variety of wildlife that inhabit this proposed park.

3. Public Support

The original acquisition of Stony Creek Ravine Nature Park was wholeheartedly supported by many of the following agencies and individuals who affirmed its wider recreation, conservation and education benefits: Oakland County Trails, Water and Lands Alliance, Huron Clinton Metropolitan Authority, Clinton River Watershed Council, Six Rivers Land Conservancy, Dinosaur Hill Nature Preserve, Rochester Community Schools, Oakland Township Safety Paths and Trails Committee, Paint Creek Trailways Commission, Michigan Department of Environmental Quality, Macomb County Planning, Trout Unlimited Vanguard Chapter, and Michigan Mountain Biking Association. Their support for this park's expansion will be reaffirmed in letters of support that will be gathered.

C. NATURAL RESOURCE ACCESS AND PROTECTION

Natural Features on Project Site, Recreation Opportunities and Site Management

The project site's relationship with surrounding land uses is optimal. Stony Creek Metropark faces the entire southern frontage of the project site along Snell Road, providing ample opportunity to link trail and ecological corridors. The project's western boundary, which is shared in entirety with the eastern boundary of Stony Creek Ravine Nature Park, lies along a very high upland area which offers excellent scenic outlooks as the ground slopes steeply to the southeast, dropping 100' in elevation from the northwest to southeast.

Approximately 50% of the 209 acres consists of former agricultural land, 25% of this property is actively farmed, and the remaining 25% includes significant forest and wetland habitats. This property is part of one of the critical natural areas that Paul Thompson, of the Cranbrook Institute of Science, studied as part of a Township-wide Ecological Survey. Please see the attached excerpts from the survey. The property would practically complete the protection of "Critical Area #3" which Mr. Thompson recommended the Township acquire to protect the rugged, forested slopes from erosion and interpret this site's scenic features and woodland habitats.

In the attached map and excerpts from Paul Thompson's ecological survey of Oakland Township he describes the forest in the northwest area of this project site as a diverse mix of swamp forest, beech, and sugar maple with a small stream winding through the woods. He advised that since this forest is one of only two wooded tracts in the township containing stands of beech and sugar maple, it would be desirable to preserve this area in combination with both the rugged upland slopes along this property's boundary and the forested slopes and floodplain of the West Branch of the Stony Creek (located in Stony Creek Ravine Nature Park). The preservation of these areas, as Critical Area #3, offers an interesting combination of natural features which retain a portion of the valuable scenic features of the township.

Observations from a spring 2014 site visit confirmed that many natural features originally described by Mr. Thompson are still intact including abundant spring ephemeral wildflowers and vernal pools. Please see the attached Natural Communities Map for SCRNP East Addition. In the Southern Dry Forest community native species noted included the shrub prickly ash (*Zanthoxylum americanum),* which is host to the prickly ash swallowtail. Large walnut and oak trees were present in the overstory and spring beauty (*Claytonia virginiana*) was present on the forest floor. The Mesic Southern Forest/Southern Hardwood Swamp complex would be considered the most intact natural community on the property. The forest floor showed signs of healthy populations of spring ephemerals (see attached pictures) including trout lilies (*Erythronium* spp.), spring beauty (*Claytonia virginiana*), and toothwort (*Dentaria laciniata)*. The overstory included

some large bur oaks, walnuts, and maples and some American beech trees were also present. The mesic southern forest graded into southern hardwood swamp in some areas. Some ephemeral pools were present, with water flowing slowly between pools. Sedges, marsh marigold (*Caltha palustris*) and golden ragwort (*Senecio aureus)* were beginning to grow. Red-wing blackbirds were heard calling in and around the wetland features.

Natural Area Buffers and Wildlife Corridors

Stony Creek Nature Park Expansion provides a unique opportunity to connect and buffer important habitats within the Stony Creek subwatershed that are already in permanent protection. This project would buffer more than 2000 linear feet of the West Branch of Stony Creek, which is one of the highest quality tributaries of the Clinton River. Stony Creek's watershed encompasses over 74 square miles, representing approximately 10% of the 760-square-mile Clinton River basin. Please see the attached Stony Creek Critical Area map.

The project site will act as a buffer for the 60 acres of natural areas in Stony Creek Ravine Nature Park, which is owned in entirety by Oakland Township and is also protected by a 36-acre conservation easement held by Six Rivers Land Conservancy, that includes the 2000 linear feet of the West Branch of Stony Creek, as well as forest communities and grassland remnants. The attached August 2005 Ecological Assessment of Stony Creek Ravine Nature Park, completed by Weatherbee's Botanical Surveys, classifies SCRNP as "an important natural resource at a state-wide level" based upon the quality of the natural communities and wildlife found on this site. This document describes in detail the unfragmented habitats of the creek, wetland complex and oak-hardwoods that define this project site. Their field surveys and assessments address plant, mammal, amphibian and reptile communities and document a population of Jacob's Ladder (*Polemonium reptans)*, which is a state threatened plant species.

Stony Creek Nature Park Expansion will also buffer the diverse ecosystems in the Sheldon property portion of Stony Creek Metropark. This proposed park expansion would help protect the water source for these natural habitats, which feed southward into Stony Creek Lake of Stony Creek Metropark. The Sheldon property is comprised of wet-mesic forest, mesic and wet-mesic prairie and a tamarack fen adjacent to the Stony Creek. The wet-mesic forest has been identified by MNFI as an exemplary natural community containing two rare species of plants.

The current property owner has submitted a wetland banking pre-proposal indicating the intention to provide a conservation easement to the MDEQ on approximately 50 acres of restored wetlands at this project site. Oakland Township Parks and Recreation is proposing to acquire the remaining property rights after the conservation easement is executed. The wetland restoration easement areas will significantly increase the recreation value of this site; converting agricultural fields to habitat for a variety of birds,

reptiles and amphibians, providing new wildlife observation and environmental education opportunities. OTPRC would request that the MDEQ conservation easement permit trail access around the perimeter of the restored wetland areas, using proposed water retention berms for elevated viewing of natural areas. The recreation experience will be greatly enhanced by the viewing opportunity that the additional 2+ miles will afford into oak-hickory and beech-sugar maple woods as well as existing and proposed forest, shrub and emergent wetlands.

This project will protect two groups of highly valued wetlands:

1. 13 existing wetlands totaling 50 acres; three of which range from 6 to 20 acres in size. The attached report by J&L Consulting emphasizes the environmental value of two wetlands that have creeks flowing through them and two other wetlands that provide significant waterfowl habitat.

2. Three proposed wetland mitigation basins, ranging in size from 11 to 23 acres, will be constructed as shown on the attached Preliminary Concept Plans. This restoration of 50 acres of poorly drained farm fields to a combination of marsh, forest and shrub wetlands will support a minimum of eight native wetland herbaceous species, 300 native wetland shrubs per acre, and 300 native wetland trees per acre. Goals for these proposed wetlands will include providing habitat for waterfowl, wading birds, perching and shorebirds, reptiles, and amphibians; similar to the those goals in the attached Bell River Watershed Wetland Mitigation Bank Description for St. Clair County.

The Michigan Department of Environmental Quality (MDEQ) would hold a conservation easement on 50 acres of wetland mitigation areas and would verify that Michigan wetland restoration performance and maintenance standards are met by the wetland bank sponsor; Divine Home Associates (an LLC under the MJC Companies). Please see the attached Letter to the MDEQ which indicates this intent as well as the model MDEQ Wetland Mitigation Banking Agreement which outlines the wetland bank sponsor's responsibilities to own, establish, operate, maintain and provide for protection of the wetland bank. Oakland Township Parks and Recreation would maintain natural areas and facilities on the remaining 159 acres.

Oakland Township Parks and Recreation is committed to managing all Oakland Township park natural areas, such as the Stony Creek Ravine Nature Park Expansion, for wildlife/ecological values with appropriate public access and recreation. Please see the attached proposed maintenance plan for natural areas and recreation facilities.

The commitment to natural area stewardship is cited in the 2015-2019 Oakland Township Parks, Recreation and Land Preservation Plan within the Vision for Natural Areas Stewardship on page 82 and specifically Strategy 5.9 on page 83 to "implement natural area management plans". We have funding, staff, contractors and volunteers devoted to the management of important wetland, woodland and grassland areas within our

Township parks and along the Paint Creek Trail. Oakland Township Parks and Recreation will manage this additional property in coordination with the attached Stony Creek Ravine Nature Park (SCRNP) and SRLC easement management plans and with the Huron Clinton Metropolitan Authority. These activities, which would commence immediately after acquisition, will be funded by the Township's land preservation millage, a 10-year, .75-mill tax that funds the preservation of open land representative of the Township's natural and rural history. Please see the attached list of management activities that OTPRC has already accomplished at SCRNP since 2008 which include monitoring, invasive plant management, and trail clearing.

SCRNP would also greatly benefit from additional controlled hunting in the proposed expansion area. The attached 2015 aerial deer survey of SCRNP recorded a density of 182 deer per square mile which is nine times the amount biologists recommend to sustain natural community health. Controlled hunting, which has been offered every autumn at Stony Creek Ravine Nature Park during the past seven years, could be greatly expanded to accommodate more hunters. OTPRC offers a limited number of permits for hunting antlerless deer with bow and arrow during archery season. Please see the attached 2014 SCRNP controlled hunt procedures and application form.

Michigan Natural Resources Trust Fund Application 2015

Organization: Oakland Charter Township **TF15-0130**

Section A: Applicant Site and Project Information: Stony Creek Ravine Nature Park

***Is the application for site development or land acquisition?** Development ✓ Acquisition				
***Name of Applicant** (Government Unit) Oakland Charter Township			***Federal ID Number** 38-2004632	***County** Oakland County
***Name of Authorized Representative** Melinda Milos-Dale			***Title** Parks and Recreation Director	
***Address** 4393 Collins Road			***Telephone** (248) 651-7810 **Fax**(248) 601-0106	
***City** Rochester	***State** MI	***ZIP** 48306	***E-mail** mmdale@oaklandtownship.org	
***State House District** District 45	***State Senate District** District 16		***U.S. Congress District** District 9	

***Proposal Title** (Not to exceed 60 characters)
Stony Creek Ravine Nature Park Expansion

***Proposal Description**

Expansion of Oakland Township's 60-acre Stony Creek Ravine Nature Park though acquisition of 209-acres including MNFI Priority 2 natural area, forests, wetlands and active farm fields. The 209-acre acquisition is composed of 74-acre fee simple purchase and the purchase of less-than fee simple rights on the remaining 135 acres. Some farm field areas within the 135-acres are proposed for wetland restoration and participation in mitigation banking. Oakland Township would purchase the remaining property rights after the current land owner furnished conservation easements to the MDEQ for the creation of the wetland areas. The 209-acre addition would connect trail and ecological corridors with both Stony Creek Ravine Nature Park and Stony Creek Metropark, provide improved trail and vehicular access from Snell Road, increase length of proposed multi-use trails to more than 2 miles, offer a local/regional trail head composed of a vehicular entrance and parking lot, and a play structure.

***Address of Site**	***City, Village or Township of Site**	***Zip**
10-25-100-009 and 10-25-200-001	Oakland Township	48306

***County in which Site is located**	***Town, Range and Section Numbers of Site Location** *Letters must be upper-case:* *(examples: T02N, R13E, 22)*	***Latitude/Longitude at park entrance**
Oakland	(Town) T04N (Range)R11E (Section)25	42.734529 -83.106918

***Park Name**
Stony Creek Ravine Nature Park

Section B: Project Funding and Explanation of Match Sources

SOURCES OF MATCHING FUNDS	PROJECT COST AMOUNTS
***Grant amount requested (round to the nearest hundred dollars)**	$2,216,400.00
Total Match	$738,900.00
Total Project Cost	$2,955,300.00
Percentage of match commitment **(Must be at least 25% of total project cost)**	25%
a) General Funds or Local Restricted Funds (Applicant's own cash)	$738,900.00
b) Force Account Labor/Materials (Applicant's own paid labor or materials)	
c) Federal or State Funds	

You have entered a value for item c). ***Please provide the information below for each federal or state program from which matching funds will be provided.*** *COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) AND RECREATIONAL TRAILS PROGRAM (RTP) ARE THE ONLY FEDERAL FUNDS THAT CAN BE USED AS MATCH:*

*(1) Program Name	*Administering Agency	
*Contact Name for Administering Agency	*Telephone	*Amount

*Type of Funds

Grant funds awarded — Date grant funds approved

Grant funds applied for, not yet approved — Estimated approval date

Appropriated funds — Date appropriated

Other, explain

*Is documentation containing the scope of work and budget for the other grant funds included with application?
Yes No
*Is documentation (such as grant approval letter) that verifies the availability of funds included in the application?
Yes No

Check to add program information for additional State of Federal funds that will be used as Match.

Section B: Project Funding and Explanation of Match Sources

(2) Program Name	Administering Agency	
Contact Name for Administering Agency	Telephone	Amount

Type of Funds

Grant funds awarded

Date grant funds approved

Grant funds applied for, not yet approved

Estimated approval date

Appropriated funds

Date appropriated

Other, explain

Is documentation containing the scope of work and budget for the other grant funds included with application?
Yes No

Is documentation (such as grant approval letter) that verifies the availability of funds included in the application?
Yes No

Check to add program information for additional State of Federal funds that will be used as Match.

(3) Program Name	Administering Agency	
Contact Name for Administering Agency	Telephone	Amount

Type of Funds

Grant funds awarded

Date grant funds approved

Grant funds applied for, not yet approved

Estimated approval date

Appropriated funds

Date appropriated

Other, explain

Is documentation containing the scope of work and budget for the other grant funds included with application?
Yes No

Is documentation (such as grant approval letter) that verifies the availability of funds included in the application?
Yes No

d) Cash Donations

Section B: Project Funding and Explanation of Match Sources

You have entered a value for item d). ***Please list the individual sources and the amounts to be donated below.***

SOURCE	AMOUNT
*	
Total	**$0**

*Is a letter of intent from each donor included with the application?
Yes No

e) Donated Labor and/or Materials

You have entered a value for item e). ***Please include each item to be donated, the source, dollar value, and how the dollar value was determined.***

ITEM	SOURCE	DOLLAR VALUE	VALUATION METHOD
*			
	Total	$0	

*Is a letter of intent from each donor included with application?
Yes No

f) Donated Land Value (acquisition applications only)

You have entered a value for item f). ***Please describe how the value of the land donation was determined.***

*

*Is a letter from the landowner committing to the donation of a portion of fair market value and any conditions placed upon their commitment included with application?
Yes No

Section C1: Project Details

Land Acquisition Applications ONLY

***Interest acquired will be** (check all that apply)

- ✔ Fee Simple
- Easement
- ✔ Other 74 AC fee simple, 135 AC less than

*What are the current land uses that exist on the parcel? (check all that apply)

- ✔ Undeveloped/natural land
- ✔ Agricultural
- Residential
- Commercial (including timber extraction)
- Recreational
- Other (describe)

*Any buildings on the site? ✔ No Yes

*Any encroachments or boundary disputes with neighbors? ✔ No Yes

Parcel Information Table

*Itemize estimated cost information for each parcel. For phased projects, the parcels and dollar amounts provided should include all phases.

	LANDOWNER	ACREAGE	STATE EQUALIZED VALUE (SEV)	(1) ESTIMATED APPRAISED VALUE ($)
1)	Divine Home Associates	209	$1,091,200.00	$2,865,200.00
2)				
3)				
4)				
5)				
	TOTALS	**209**	**$1,091,200.00**	**$2,865,200.00**

(2) ESTIMATED INCIDENTAL COSTS

Section C1: Project Details

Prorated Taxes	$20,600.00		
Recording Fees	$100.00		
Transfer Tax	$24,000.00		
Title Insurance	$7,000.00		
Appraisal Fees	$20,000.00		
Closing Fees	$300.00	TOTAL APPRAISED VALUE (1)	$2,865,200.00
Environmental Assessment Costs	$18,100.00	TOTAL INCIDENTAL COSTS (2)	$90,100.00
TOTAL	**$90,100.00**		
		TOTAL ACQUISITION COSTS	**$2,955,300.00**

Comments:

Section D: Justification of Need

*1) If you are submitting multiple acquisition or development applications, what is the priority for this application? (1 = highest) 1

*2) What page(s) of your recreation plan is the need for the proposed project discussed? From: 87 To: 89
If proposed project is on only one page, please enter the page number in both boxes

*3) What was the date(s) of public meeting to discuss submission of the grant application? 3/16/2015
Additional dates: 03/24/2015

*4) Did you gather public input from individuals with disabilities, their families, or advocates? ✔ No Yes

*5) Are you the primary provider of recreation services to any surrounding communities, as documented in your recreation plan? ✔ No Yes
List Communities:

*6) Was the application developed through collaboration with adjacent communities or school districts? ✔ No Yes

Section E: Application History and Stewardship

1	NO	YES
*1) Questions 1 is for *acquisition applications only - for development projects, leave blank and move to question 2.*Is the applicant financially solvent to complete the acquisition transaction without any third party assistance (i.e. loans, lines of credit, same day closings, etc.) until partial reimbursement and final audit is completed (approximately 180 days after closing)? If yes, please provide documentation that supports this.	✔	
* 2) Has applicant received DNR recreation grant(s) in the past?		✔
If yes, does applicant currently have an open, active grant?	✔	
*3) Has applicant closed, sold, or transferred any parkland or recreation facilities in the past 5 years?	✔	
*4) Does applicant have a known unresolved conversion of grant-assisted parkland? (a conversion is a change from public outdoor recreation use to some other use)	✔	
*5) Does applicant have a "residents only" policy for this park or other parks or recreation facilities?	✔	
*6) Do you now or do you intend in the future to charge an entrance fee to the project site?	✔	
If yes, fee schedule and policy for reduced entrance fees for low-income users included with application?		

If yes, attach supporting Documentation on Required Attachments page.

*7) What is the applicant's current year budget for parks and recreation?	$2,766,202.00
*8) What are the estimated operation and maintenance costs associated with the project?	$25,000.00

Comments:
Recreation Grant History, Charter Township of Oakland

Project Number- Grant Amount -Project Results

TF99-128- $ 2,010,101 -Acquisition of Marsh View Park
TF00-311- $ 313,302 -Development of Bear Creek Nature Park
TF02-013- $ 1,762,800 -Acquisition of Lost Lake Nature Park
TF05-102- $ 893,700 -Acquisition of Stony Creek Ravine Nature Park
TF07-057- $ 293,300 -Development of Marsh View Park
TF10-069- $ 154,900 -Development of Lost Lake Nature Park

Section F: Site Conditions

	NO	YES	UNKNOWN
*1) Does the applicant, landowner, or others have knowledge that any portion of the property is or has been used for industrial purposes, including manufacturing and/or minerals' processing or extraction (sand, gravel, oil, or gas) at this time or in the past?	✔		
*2) Does the applicant, landowner, or others have knowledge that any portion of the property is currently being used or has been used in the past for a gas station, motor vehicle service or repair facility, commercial printing facility, dry cleaners, photo developing lab, junkyard, landfill, waste treatment, storage, processing or recycling or disposal facility?	✔		
*3) Does the applicant, landowner, or others have knowledge that any of the following are or have in the past been stored, discarded, or used on the property – automotive or industrial batteries, pesticides or other chemicals used in agricultural practices, paints, industrial waste, or other chemicals in drums or other containers?	✔		
*4) Does the applicant, landowner, or others have knowledge that fill dirt or other fill material of unknown origin is on this property or has in the past been placed on the property?	✔		
*5) Does the applicant, landowner, or others have knowledge of any evidence of leaks, spills, or stains from a substance other than water at this time or in the past?	✔		
*6) Does the applicant, landowner, or others have knowledge that there are or have in the past been waste disposal pits, lagoons, or ponds on the property?	✔		
*7) Does the applicant, landowner, or others have knowledge that there are at this time or have in the past been registered or unregistered storage tanks on the property?	✔		
*8) Does the applicant, landowner, or others have knowledge that contaminated groundwater lies below the property?	✔		
*9) If there is a water well on the property, does the applicant, landowner, or others have knowledge that contaminants have been identified in the well that exceeded legal standards or has the well been identified as contaminated by a government agency?	✔		

Section F: Site Conditions

	NO	YES	UNKNOWN
*10) Has the landowner been notified about any current violations of environmental laws pertaining to activities on the property or does applicant, landowner, or others have knowledge about past violations?	✔		
*11) Has the landowner been notified of any environmental assessments of the property that identified a) the presence of hazardous substances, petroleum products, or contamination; or b) the need for further assessment?	✔		
*12) Does the applicant, landowner, or others have knowledge that any hazardous substances, unidentified waste materials, tires, or automotive or industrial batteries have been dumped above ground, buried, or burned on the property?	✔		
*13) Is the property listed on any federal or state list of contaminated sites, including the site of a leaking underground storage tank?	✔		
*14) Does the applicant, landowner, or others have knowledge that any of the adjoining properties are currently being used or have been used in the past for the purposes listed in the previous questions 1-13?	✔		
*15) Has an environmental assessment been completed for the site? If yes, provide the most current on the Required Attachments page.	✔		
*16) Are permits required for the development of the site? If yes, please complete the following table:		✔	

TYPE OF PERMIT	PERMITTING AGENCY	EFFORTS TAKEN TO OBTAIN PERMIT OR DETERMINING PERMIT REQUIREMENTS
Wetland 303 Permit Fill App.	Michigan Dept. of Environmental Quality	Application to be Sumbitted by April 1, 2015

If **'Yes'** or **'Unknown'** was selected for any of the questions on this page, please explain here:
Regarding Wetland 303 Permit Application: This permit would be for the berms, water control structures, and overflow control structures for Wetland Mitigation Basins A, B, C that are proposed for wetland mitigation banking on parcel 10-25-200-001. The construction of these wetland

mitigation basins is projected to be completed by Fall 2015.

Section G: Natural Features of The Project Site

To the best of your knowledge, does the project site include:

***Great Lakes shoreline or Great Lakes connecting water frontage?** ✔ **No Yes**
If yes, name of Great Lake or Great Lakes connecting water:
How many linear feet of shoreline or frontage?

***Inland lake frontage?** ✔ **No Yes**
If yes, name of water body:
What is the size of the total water body in acres?
How many linear feet of frontage are on site?

***River and/or tributary frontage?** ✔ **No Yes**
If yes, name of water body:
How many linear feet of frontage?
Is the river or tributary a state natural river or a federally dedicated wild and scenic river? No Yes

***Wetland acreage or frontage?** **No** ✔ **Yes**
If yes, please list the number of acres of the type(s) of wetland(s) on site:

Marsh	37	Bog		Dune and swale complex	
Prairie		Forest	9	Boreal Forest	
Fen		Shrub	5	Type unknown	52

Is documentation of type and quality with application? No ✔ Yes
If yes, source of information: J&L Consulting, Brooks Williamson

***Other water acreage or frontage?** ✔ **No Yes**
If yes, name of other water body:
Is the entire water body completely within the site boundaries? No Yes
How many linear feet of frontage or acres of water are on site?

***Sand dunes?** ✔ **No Yes**
If yes, list the number of acres of sand dunes on the site:
Critical Not designed as critical, or designation unknown
Is documentation of type and quality provided with application? No Yes
If yes, source of information:

***Dedicated state or federal listed wilderness or dedicated natural area or Pigeon River County State Forest land or inholding?** ✔ **No Yes**
If yes, name of area:
How many acres on site?

Section G: Natural Features of The Project Site

***Rare species or any other significant feature as defined by the Michigan Natural Features Inventory?** ✔ No Yes

If yes, list species or feature and status.

If too many to list here, include in the application narrative.

Population/range locations denoted on site plan or other map? No Yes

Section H: Wildlife Values of The Project Site

Will the proposed park or park development:

* **Protect wildlife habitat** (for example, breeding grounds, winter deeryards, den sites)?	**No ✔ Yes**
If yes, list species:	See Attached Lists of Species
How many acres of habitat does the site provide?	209
***Act as a wildlife corridor between existing protected areas or buffer an existing protected area?**	**No ✔ Yes**
If yes, name the existing park(s) or protected area(s):	Stony Creek Metropark, Stony Creek Ravine Nature Park
How many acres are currently in protected status?	4521
Is documentation of the ecological value of adjacent protected areas and/or the ability of the project site to act as a corridor/buffer provided with application?	No ✔ Yes
If yes, source of information:	Weatherbee's Botanical Surveys, MNFI Survey of Stony Creek Metropark

Section I: Natural Resource Recreation Opportunities

Will the proposed park or park development provide new or additional:

***Water recreation opportunities?**	✔ **No Yes**
***Motorized recreation opportunities (ORV and/or Snowmobile)?**	✔ **No Yes**
***Hunting Opportunities?**	**No ✔ Yes**
If yes, what seasons will be available? (for example, deer/firearm)	Deer/Archery
How many acres will be available for hunting?	100
***Fishing opportunities?**	✔ **No Yes**
If yes, what type of fishing opportunities will be provided? (species/methods)	
***Bird watching or other nature viewing opportunities?**	**No ✔ Yes**
If yes, what species can be viewed?	See attached Audubon Checklists
***Nature interpretation or education opportunities?**	**No ✔ Yes**
If yes, how are the interpretation or education opportunities provided? (check all that apply)	

✔ Interpretive signage
✔ Interpretive brochures
Nature center
✔ Part time or volunteer naturalist
Full time naturalist

Have you formed a partnership with another organization to provide interpretive/educational services?	**No ✔ Yes**
If yes, name of organization	Dinosaur Hill Nature Preserve

Provided examples of interpretive materials, descriptions of classes, and other documentation on the interpretive/educational services provided with application:

Please find attached several pages from the 2015 Winter and Spring Oakland Township Parks and Recreation Newsletter that include nature programs that we currently offer for children, families, and adults at a variety of Oakland Township parks. There is also a page of Natural Areas Stewardship programs and volunteer workday opportunities which include weekly Bird Walks. Proposed program ideas for the project area are also included to interpret the site's glacial history and wildlife including owls, turkeys and coyotes.

On the attached Preliminary Site Development Plan we are proposing the addition of three interpretive signs to describe wetland and habitat restoration areas as well as other interesting features such as a specimen oak tree.

Section J: Public Access Opportunities

*** Will the site be open to the general public?** No ✔ Yes

List the hours open to the public:

	From	To	Closed
Sunday	Sunrise	Sunset	
Monday	Sunrise	Sunset	
Tuesday	Sunrise	Sunset	
Wednesday	Sunrise	Sunset	
Thursday	Sunrise	Sunset	
Friday	Sunrise	Sunset	
Saturday	Sunrise	Sunset	
Holidays	Sunrise	Sunset	

Comment:

How will the public reasonably able to access this site?

✔ Automobile
Boat
✔ Public Transportation
Motorized Trail
✔ Non-Motorized Trail including Mountain Bike and Hiking Trails
✔ Sidewalk or Pathway
Other (describe)

Section K: Trails

*** Is the proposed site a trail?** **[ ] No [✔] Yes**

Who is the primary intended user? (Check one)

✔ Hikers/Pedestrians	Road Bicyclists	Equestrians
Mountain Bicyclists	Cross-Country Skiers	Snowmobilers
Other motorized vehicle users	Other, explain:	

Who are the secondary users?

Hikers/Pedestrians	Road Bicyclists	Equestrians
✔ Mountain Bicyclists	Cross-Country Skiers	Snowmobilers
Other motorized vehicle users	Other, explain:	

Is the trail connected to another trail(s) or part of a larger trail network? No ✔ Yes

If yes, what is the name of the network? Oakland Township, Stony Creek Metropark

How long Is the trail?
10560 Total linear feet
Linear feet bituminous (paved)
Linear feet boardwalk (if applicable)
Linear feet sidewalk
10560 Linear feet other hard surface

What is the width of the trail?
4 Linear feet

*** Is this proposed project part of the Iron Belle Trail (Governor's Showcase Trail)?**
[ ] Yes [✔] No

Natural Areas Stewardship at Stony Creek Ravine Nature Park Since Acquisition

- 2008
  - Cut autumn olive and treated stumps in 0.25 acres of upland fields
  - Cleared brush along trails
- 2009
  - Controlled Japanese barberry, buckthorn, autumn olive, common privet, and honeysuckle in 20 acres in the upland fields and along the stream corridor
  - Treated oriental bittersweet along 500 feet of stream corridor
  - Cleared brush along trails
  - Installed deer hunting safety zone signage
  - Installed "Park Property" signs every 100 feet around perimeter of park
- 2010
  - Swept park for garlic mustard
  - Foliar sprayed oriental bittersweet on 3 acres adjacent to hiking trails
- 2011
  - Monitored encroachment from adjacent properties
  - Monitored photo points
- 2012
  - Monitored encroachment from adjacent properties
  - Monitored photo points
  - Spot burned buckthorn seedlings in 1.3 acres of forested areas
  - Controlled large buckthorn in 2 acres of upland and stream corridor using drill-and-fill
  - Cut autumn olive, buckthorn, Japanese barberry, and common privet and treated stumps on 12 acres of upland adjacent to trails and along the stream corridor
- 2013
  - Monitored encroachment from adjacent properties
  - Monitored photo points
  - Completed aerial survey to determine deer density
  - Swept park for garlic mustard and pulled 2nd year plants
  - Cut autumn olive in upland fields and treated stumps in 3 acres of upland field
  - Foliar sprayed small patches of swallow-wort in northeast corner
- 2014
  - Monitored encroachment from adjacent properties
  - Monitored photo points
  - Completed aerial survey to determine deer density
  - Swept park for garlic mustard and pulled 2nd year plants
  - Spot treated oriental bittersweet in 3.5 acres of upland fields and forested areas along the trail
  - Foliar sprayed small patches of swallow-wort in northeast corner

Stony Creek Ravine Nature Park

Comprehensive Management Plan

David Mindell
Matt Demmon
PlantWise, LLC
Ann Arbor, MI

May 2010

Table of Contents

Overall Observations and Site Description

The Stony Creek Ravine Nature Park is a complicated mixture of good quality and degraded areas. The dry-mesic southern oak forest and floodplain forest/southern wet meadow areas on the western portion of the site have the potential to shift to a high-quality state, while the old-field /early-successional forested area to the east is highly degraded and will require extensive restoration efforts. Though the park will require a significant amount of time and effort to restore, it merits such work as a way to both save those portions with nice botanical diversity, while simultaneously preventing the park from becoming a major weed source for surrounding areas. This notion of park-as-invasive-plant-source is created in large part by the presence of the West Branch of Stony Creek flowing through the site, thereby acting as a corridor both to and from the park.

The 60-acre site offers a series of extremely variable habitats. From west to east, there are relatively distinct bands of flat dry-mesic southern forest, wet meadow/floodplain forest, steeply sloped dry-mesic southern forest, early forest succession/old field/prairie remnants. These bands, in conjunction with the creek that flows through them, provide excellent habitat for a variety of both plants and animals.

Stony Creek is one of the highest quality creeks in the area, and while several township parks are located in it's watershed, its presence here is wonderful. The natural meanders of the creek are preserved, and it is surrounded by mature forest. Further value is added by the site's close proximity to Stony Creek Metropark (located just downstream), another protected area. Preserving natural areas along waterways is a critical component of water quality, and in part through that, of wildlife and plant habitat.

Overall Goals and Intended Site Uses

The main goal for Stony Creek Ravine Nature Park is to preserve the natural beauty and ecological functioning of the creek. The park is not suited for active uses, due to its steep topography and high-quality habitats. Use of the park should be restricted to hiking and nature appreciation.

Secondary goals are the preservation of the oak woods and wet meadows on either side of the creek, and protection of habitat for the state-threatened Jacob's ladder.

Soils

The eastern upland portion of Stony Creek Ravine Nature Park is made up of the Fox soil type. The very well drained Fox sandy loams are formed from a layer of loamy loess and alluvium over sandy outwash on outwash plains, stream terraces, kames, and moraines. Riddles soils compose the upland portion of the site to the west. They are very well drained, formed in loamy or sandy till on till plains or moraines. The portion of soil along Stony Creek is an association of Cohoctah and Fox soils. Cohoctah soils are loamy, poorly drained, and formed in floodplains from alluvial deposits.

Pre-Settlement Condition

The driest portions of this site are mapped as black oak barrens, and the rest as mixed oak forests. The site at the time of settlement was essentially composed of a large chunk of oak ecosystems of varying canopy percentages with the very thin unmapped band of the creek and associated wetland habitats. Boundaries between the two oak habitats may have changed frequently due to wildfire affecting the canopy composition of each.

Mixed oak forests were dominated by black and white oaks, with minor components of other trees such as black cherry, pignut hickory, and sassafras. Frequently found adjacent to black oak barrens, they represented a slightly less fire-prone habitat, yet they were drier and more fire-prone than oak hickory forests. The largest concentration of this habitat type occurred on sand plains and sandy, rolling ridges in the southeast Michigan counties of Macomb, Oakland, Washtenaw, Livingston and Jackson. Mixed oak forests made up 1.1% of Michigan's landforms.

Black oak barrens comprised about 1.9% of Michigan's landscape at the time of the original surveys of Michigan. They were found on flat sand plains and rolling, gravelly hills in the interior portion of the southern Lower Peninsula, and probably burned quite frequently. Oakland County historically contained more black oak barrens than any other county. The typical dominant tree was black oak, but Northern pin oak, white oak, and scarlet oak were also found. Prairie grasses and forbs were common in these savannas. Because of the absence of trees, much of this habitat was converted to farmland, but mostly abandoned by the 1930's because of the droughty and infertile soils. Much of this habitat that remains is in the process of succeeding to a closed-canopied oak forest, due to the lack of fire.

Current Plant Communities

While none of the natural communities present are particularly rare or unusual, their combined presence in close proximity provides greater value as habitat. To this is added the habitat value, migratory corridor, and beauty of the West Branch of Stony Creek.

The **dry-mesic southern forest** found in the uplands adjacent to the creek is an oak-dominated ecosystem maintained by frequent fires. In the absence of fire, more shade-tolerant species tend to succeed to the canopy, and a diversity of shrubs can crowd out the herbaceous understory. The canopy is relatively open at Stony Creek, except to the southwest, and deer are keeping native shrubs browsed down. However, the ground layer is too shaded to contain great diversity and the introduction of fire, along with select removal of red maple, black cherry, and elm will greatly increase diversity in the woods.

Already, in most areas, oaks are limited to large, mature trees, and the understory trees waiting for an opening in the canopy are of more shade-tolerant species. Dry-mesic southern forests are usually found on sandy loam or loam soil types, in this case on outwash plains and moraine with Fox and Riddles sandy loam soils. White and black oaks dominate, with red oaks on moister soils. Many large red oaks were noted on the

west side of the stream. Various hickories can be co-dominates, and also support fire, while shade-tolerant red maples, black cherry, and basswood are typically sub-dominant unless fire is suppressed for long periods.

Fire is the single most important disturbance factor, although windthrow and insect or pathogen outbreaks historically created small gaps in the canopy as well. There are many invasive plant threats to this community type. Control of such species as garlic mustard, swallow-wort, Asian bittersweet, common buckthorn, autumn olive, shrub honeysuckles, multiflora rose, and Norway maple is critical to the long-term viability of dry-mesic southern forests. Asian bittersweet is particularly well-established at this park, and needs immediate attention if this park's communities are to survive intact. Several small and one large patch of garlic mustard was observed, and will be relatively easy to control at this time. It is interesting to note that garlic mustard was not observed at all in the park during the 2005 plant inventory. Although a few plants were probably present at that time, this demonstrates garlic mustard's explosive growth potential. Common buckthorn, autumn olive, and several other invasive shrub species were observed in the forest, and were replete in the old field areas.

A large section of the park to the east was former agriculture land, and is classified as an **old field**, although some prairie plants and early successional forest species are found there. Heavily invaded by autumn olive and Asian bittersweet, with a smattering of other invasive shrubs, this important semi-open habitat is at risk of converting to a brushy habitat completely dominated by exotics. Even though many old field habitats are highly disturbed and usually contain a fairly low diversity of native plants, they often provide more herbaceous resources than overly thick forest remnants.

Several prairies species were observed in openings, mostly near the north entrance to the park and in the southeast portion of old field. Prairies were important habitats for nectaring insects. Fire will greatly assist in the reduction of exotic brush and stimulation of desirable native species. If fire is re-introduced to these old fields along with the control of exotic shrubs, this portion of the park can be guided on a trajectory to an open oak habitat that is at least structurally similar to the park's historical community of black oak barrens (if not as diverse floristically in the short term).

Restoration work has been done recently in this habitat. While the work is laudable, several modifications could be implemented. Many small piles of brush were created in and around autumn olive control areas. Brush should be stacked in large piles at least 50 feet apart. Many small piles will smother more vegetation than fewer large piles, will look better, and will be much easier to burn late to remove them entirely. These piles should be created on the "footprint" of dense autumn olive

thickets. In addition, several large dead zones were observed near young sprayed autumn olive. While not many native plants were present in those areas of old field, more caution should be used during spraying. A combination of fire and cutting and painting stumps will provide excellent control of shrubs while causing less damage to non-target species.

Several small **southern wet meadows** exist along the creek, along with a long stretch of **floodplain forest**. Both of these communities provide important ecosystem services such as groundwater filtration, soil stabilization, capture of sediments and nutrients from Stony Creek, and habitat for an enormous diversity of animal life. Southern wet meadows are fire-adapted, and should be burned along with adjacent uplands to prevent shrub and woody plant encroachment. However, floodplain forests burn infrequently, if at all, and rely on blowdowns and windthrow for disturbance that allows younger trees to ascend to the canopy. Most of the floodplain forest is too moist to burn, and any fire that does creep into the floodplain will be very minimal in it's effects.

With southern wet meadows, the most important management consideration besides fire is to maintain the hydrology and water quality as much as possible. Sedimentation and excessive nutrient loads can create conditions ripe for invasion by exotic plants. Similar invasives are threats for both of these habitats. Glossy buckthorn, multiflora rose, privet, barberry, reed canary grass, and *Phragmites* all pose significant threats to wetland habitat quality. Exotic shrubs were observed along the creek, and are growing most vigorously near the creek edge where sunlight and water are plentiful. A variety of highly conservative plant species were noted in Weatherbee's 2005 Ecological Assessment, including the State-Threatened Jacob's ladder (*Polemonium reptans*). This species was not seen during this assessment so the status of its habitat is not currently known. However, the habitat of this species (the transition between the dry-mesic forest and floodplain) represents a priority with regard to stewardship of the site.

Surrounding Land Uses

Large lot residential development surrounds the park on the south, northeast, and west, while to the east are large agricultural fields interspersed with blocks of woodland. Woods extend to the northwest, bordering the creek on both sides. The residential development lots are relatively large and contain small amounts of woodland, particularly on the west side of the park.

The main potential threats to this site from the residential areas are dumping of yard waste and the possibility of residential yards harboring reservoirs of invasive plants. The

Asian bittersweet that is found throughout this site is most likely present in most adjacent properties as well, which will continue as a source of seed even after the species is controlled within the park. Other invasives may gain footholds in neighboring properties as well. Garlic mustard was found at the southwest corner of the park and clearly extended south beyond the property line. Stony Creek Metropark is a much larger block of preserved land just south Snell Road to the south, greatly enhancing the habitat value of Stony Creek Ravine Nature Park. However, this portion of the Metropark is a mixed bag floristically and can also serve as a seed source for invading weeds.

Large Scale Site Stresses

1. Asian bittersweet is widespread throughout the site. This plant's ability to smother native vegetation at all levels and climb into the tree canopy where it competes with mature trees allows it to completely alter succession and composition of communities. **If there is any hope of maintaining the site for its ecological qualities, this species must be managed aggressively.**
2. Intense deer herbivory west of the creek is dramatically altering woody and herbaceous species composition. Chokecherries and young oaks were clearly browsed repeatedly and were struggling to make any new growth. Although hunting is allowed in this park, it appears that the large buffers near residential areas are still allowing many deer to utilize the site, especially on the west side. Several tree stands and bait stations were noted on the west side of the creek, and although perhaps they date from before the park's purchase, they should be investigated for use. Baiting of deer will draw more to the park and increase their population even further.
3. Lack of fire is encouraging woody plant dominance on the east side of the creek and is certainly altering plant communities and succession.
4. Neighbor dumping could be a future problem, though it hasn't been too significant to date. A brush pile was noted in two places along the north boundary as well, one just inside the park and the other apparently just outside the park property. The borders should be monitored and steps taken if needed.

Site Concerns and Prioritization

1. The West Branch of Stony Creek is the best asset of this site. Luckily, there is not much reuired in order to preserve the qualities of the creek. Maintaining the park as a natural area and restoring native plant communities while preventing inputs of toxins or sediment to the creek is the best protection the creek has from the development around it.
2. The area containing Jacob's ladder should be managed to improve habitat for the species. Management should extend outside of this immediate area to allow for plant movement as habitats and hydrology change through time. Garlic mustard and any exotic woody plants in the area should be removed while minimizing herbicide use. Bloody glove or cut and treat if necessary, but spraying should be avoided in this area due to potential drift.

3. Asian bittersweet is the species that truly complicates management activities in the park. This species is very widespread throughout the site. Without strong action here, all other management actions will not produce desired results.
4. The wet meadows and floodplain near the creek are the top priority due to their proximity to the creek and value for wildlife. Fortunately, little effort is needed there. The dry-mesic southern forest is largely intact, and the second priority. Although the old-fields contain prairie species not found elsewhere in this park, they are highly disturbed and will require the most effort to restore.
5. Reintroduction of fire. This should be initiated after one year of intensive bittersweet control. At a minimum, this should be done in the dry-mesic forested and wet meadow areas. In addition, fire could release numerous prairie species in the open and earlier successional portions of the site.

Management Actions

1. All upland areas should be swept annually for garlic mustard and dame's rocket plants. The largest patch in the northeast old field is in an area heavily invaded with other exotic species and is the last priority. While other patches are small enough for hand pulling and in high quality areas, herbicide could be used within the old field area.
2. A point of focus is the Jacob's ladder patch and the surrounding area. This area should be swept for all invasives and controlled where found. If deer browse is evident on the plants, they should be protected with wire cages.
3. Asian bittersweet should be treated in a variety of ways: large vines should cut and treated during the summer. Younger plants should be sprayed or hand swiped in late summer or early fall. Work north to south on the west side of the creek, then west to east on the east side of the creek, concentrating on sparse areas at first, later attacking dense infestations.
4. Exotic woody plants should be cut and treated. Work north to south on the west side of the creek, then west to east on the east side of the creek.
5. Remove pile of tires in north of park. In addition to not being aesthetically pleasing in a natural area, they smother vegetation, leach toxins into the soil, and complicate prescribed burns.
6. Early to mid-April would be an ideal time to get a moderate to high-intensity fire to carry through most of this park, which all stands to benefit from its reintroduction. Alternatively, the western portion of the site could be burned, leaving the open and early-successional areas to be burned at a later time. However, including the more open and early-successional areas has the advantage of reducing the number of mature invasives to act as a seed source for the site as a whole. The creek provides a natural burn break, and in the future should be utilized to break the park into 2 separate burn units.
7. Reed canary grass in the wet meadows along the creek should be sprayed in June. Outlier plants intermingled with native vegetation should be hand-swiped. Work south to north.
8. Establish trails on east side of creek. One large loop through the woods and old fields will provide access to the diverse topography and vegetation of the site. The

west side of the creek is wetter and should remain without trails to avoid the complications of crossing the creek.

9. An overabundant deer population will continue to have an adverse effect on ground layer vegetation if left unchecked. Reducing the deer population and the ensuing impact they have on the natural heritage of this site is vital to maintaining and restoring the quality of this area. In addition, check tree stands to ensure they are not girdling large oaks and remove bait stations.
10. Long-term bittersweet control will require 2-3 regular sweeps through the entire park annually for the first few years.
11. Ongoing fire will continue to stimulate native species and reduce invaders (except bittersweet). Larger red maples encroaching in upland forests should be cut or girdled when not effected by fire.
12. Control of autumn olive and restoration in the prairie remnants will likely need to include supplementary plant material in the form of seed. Old field work should begin in those areas where prairie species are found.
13. Management of early-successional woods on east side of park should target clearing around oaks and hickories, encouraging a transition to higher-quality forest.

Monitoring Recommendations

1. Monitor population of Jacob's ladder to ensure that management actions are having positive effects.
2. The creek is an outstanding feature, and presents opportunities for monitoring of fish and insect species to ascertain water quality. Stony Creek is one of the highest quality creeks in the region.
3. Complete new plant inventory throughout the park two to three years following the start of widespread restoration efforts to better understand the site response to restoration efforts. Groundcover diversity within the upland forests and the old field areas should change dramatically.
4. Monitor the spread of invasive species by establishing photo points in all plant communities throughout the park.

Undocumented Plant Species Observed

Wet Meadow

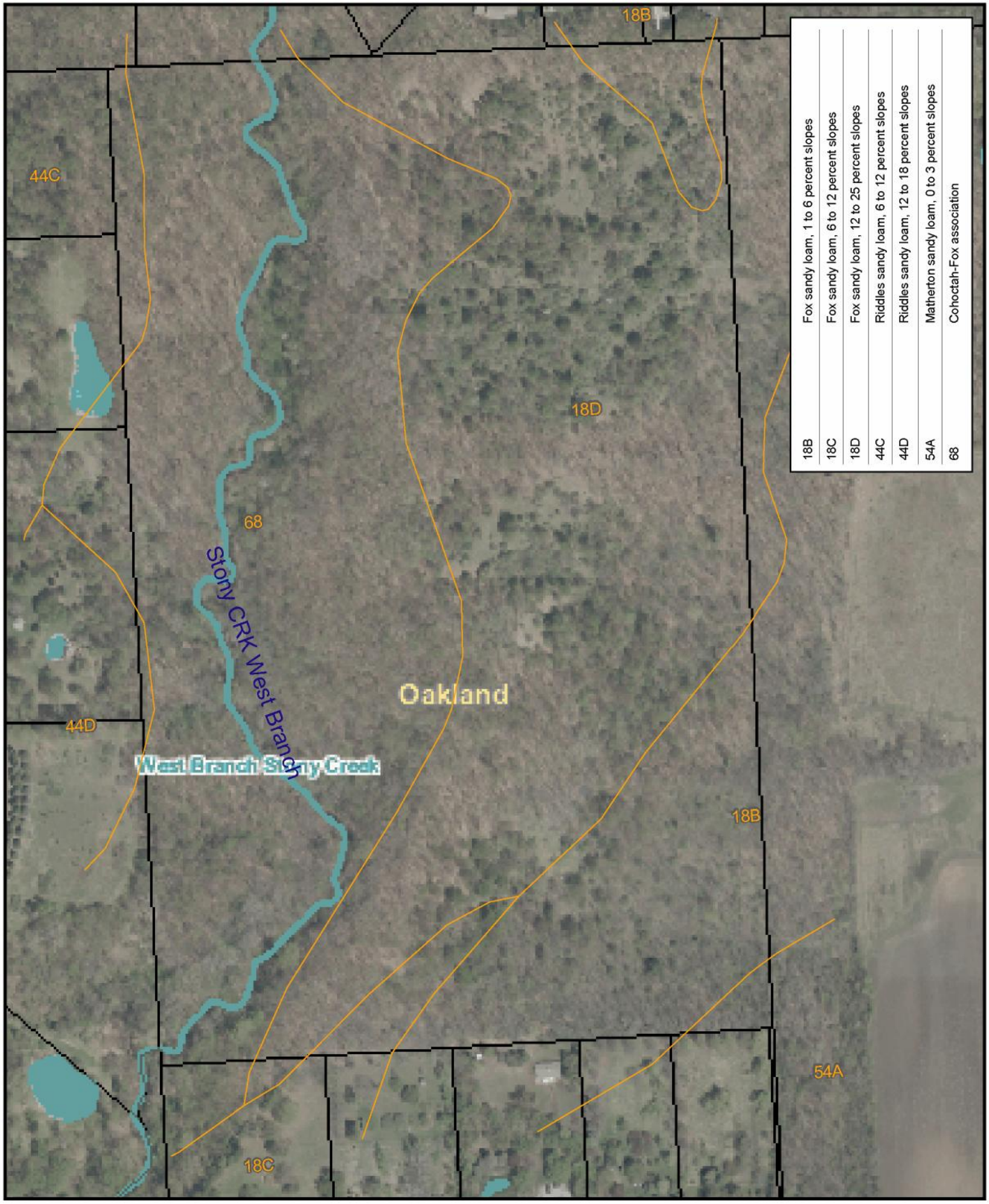
Scientific Name	Common Name	Coefficient of Conservatism
Pedicularis lanceolata	Swamp betony	8

Dry-Mesic Southern Forest

Scientific Name	Common Name	Coefficient of Conservatism
Arabis laevigata	Smooth bank cress	5

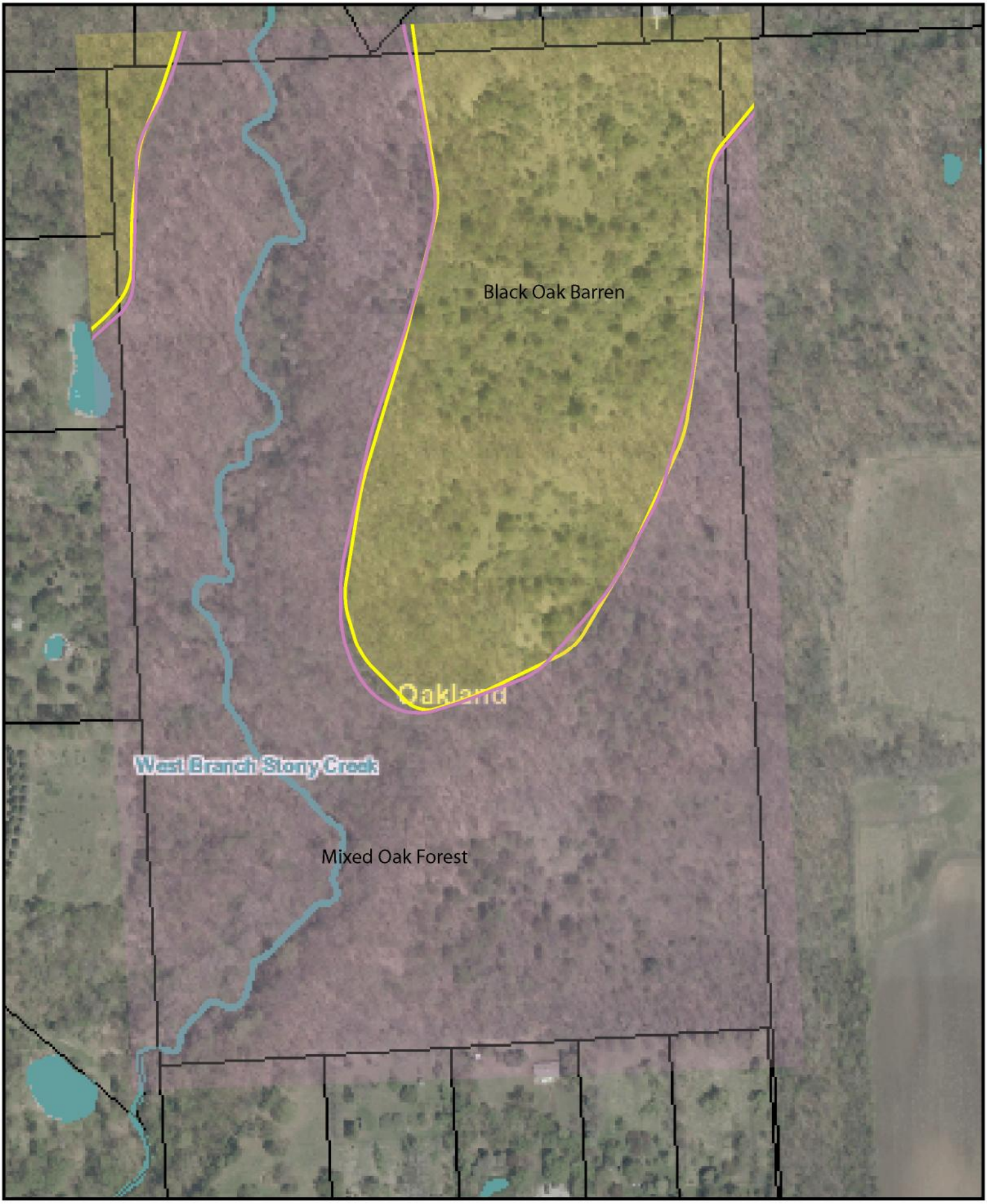
Old Field

Anemone cylindrica	Thimbleweed	6
Antennaria parlinii	Smooth pussytoes	2
Antennaria sp.	Pussytoes	
Asclepias tuberosa	Butterfly-weed	5
Aster oolentangiensis	Prairie heart-leaved aster	4
Coreopsis lanceolata	Sandl coreopsis	8
Erigeron pulchellus	Robin's plantain	5
Penstemon digitalis	Foxglove beard-tongue	2
Penstemon hirsutus	Hairy beard-tongue	5



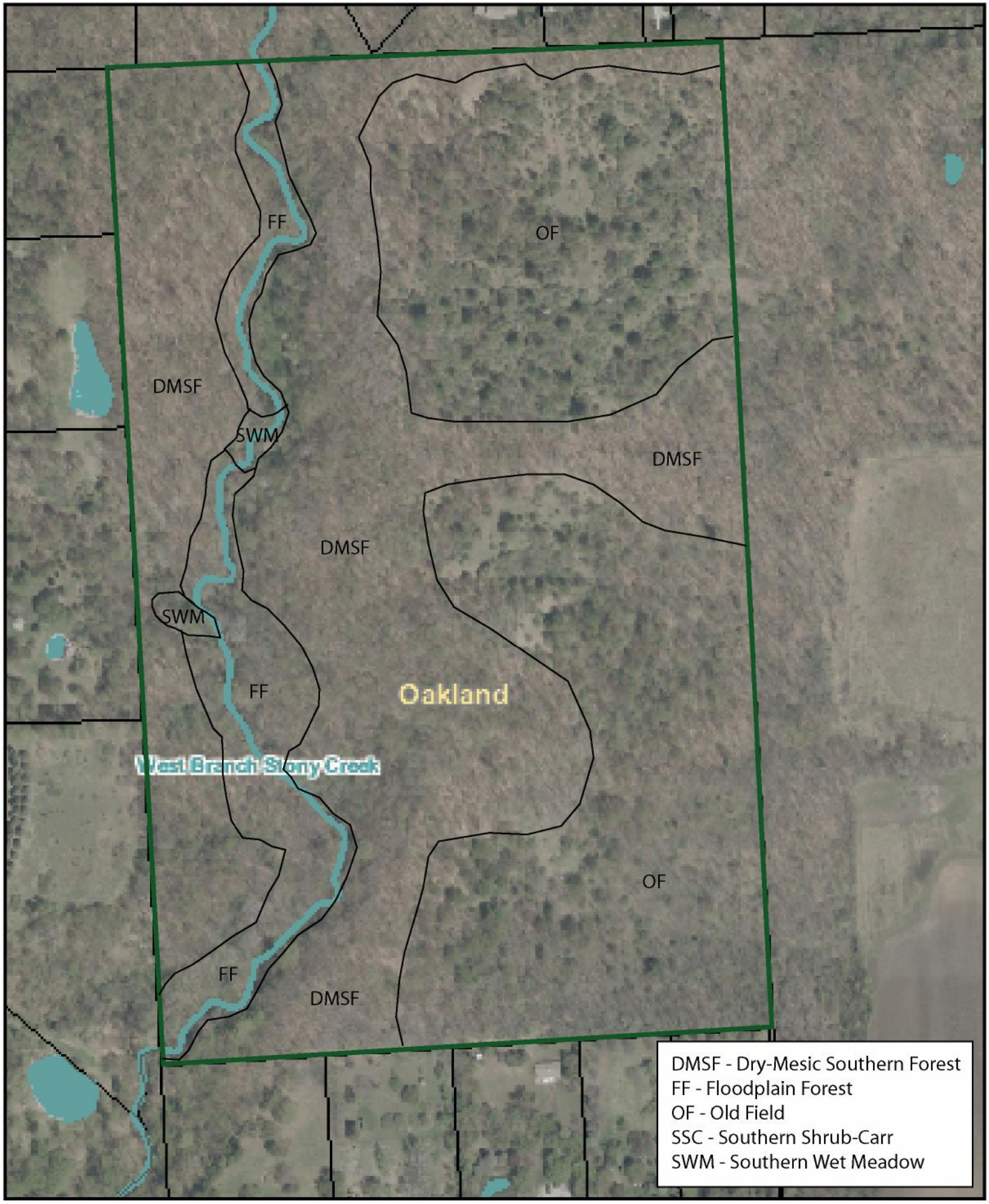
Stoney Creek Ravine Nature Park - Soil Types

Plantwise, LLC 2009



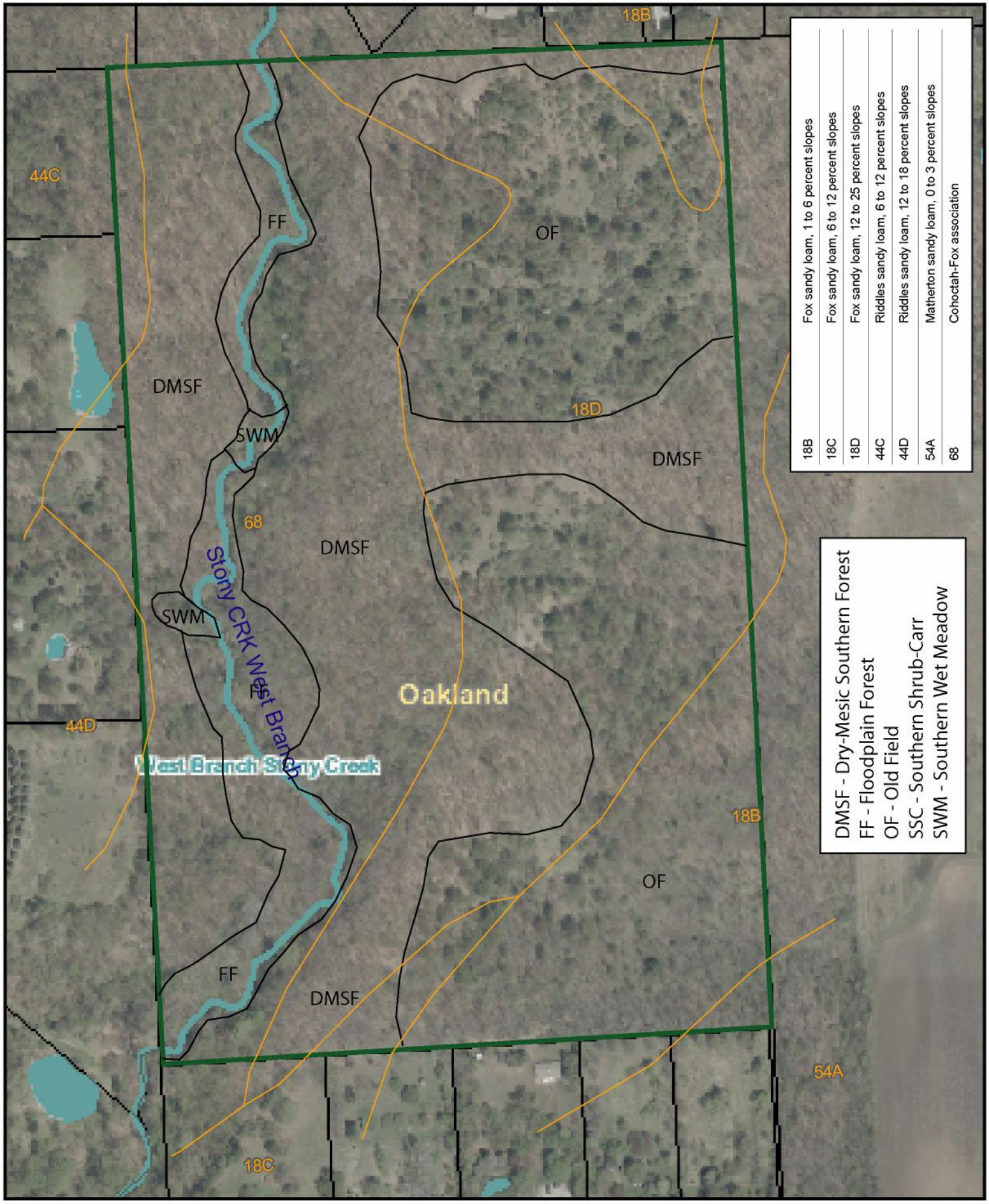
Stoney Creek Ravine Nature Park - Presettlement Vegetation

Plantwise, LLC 2009



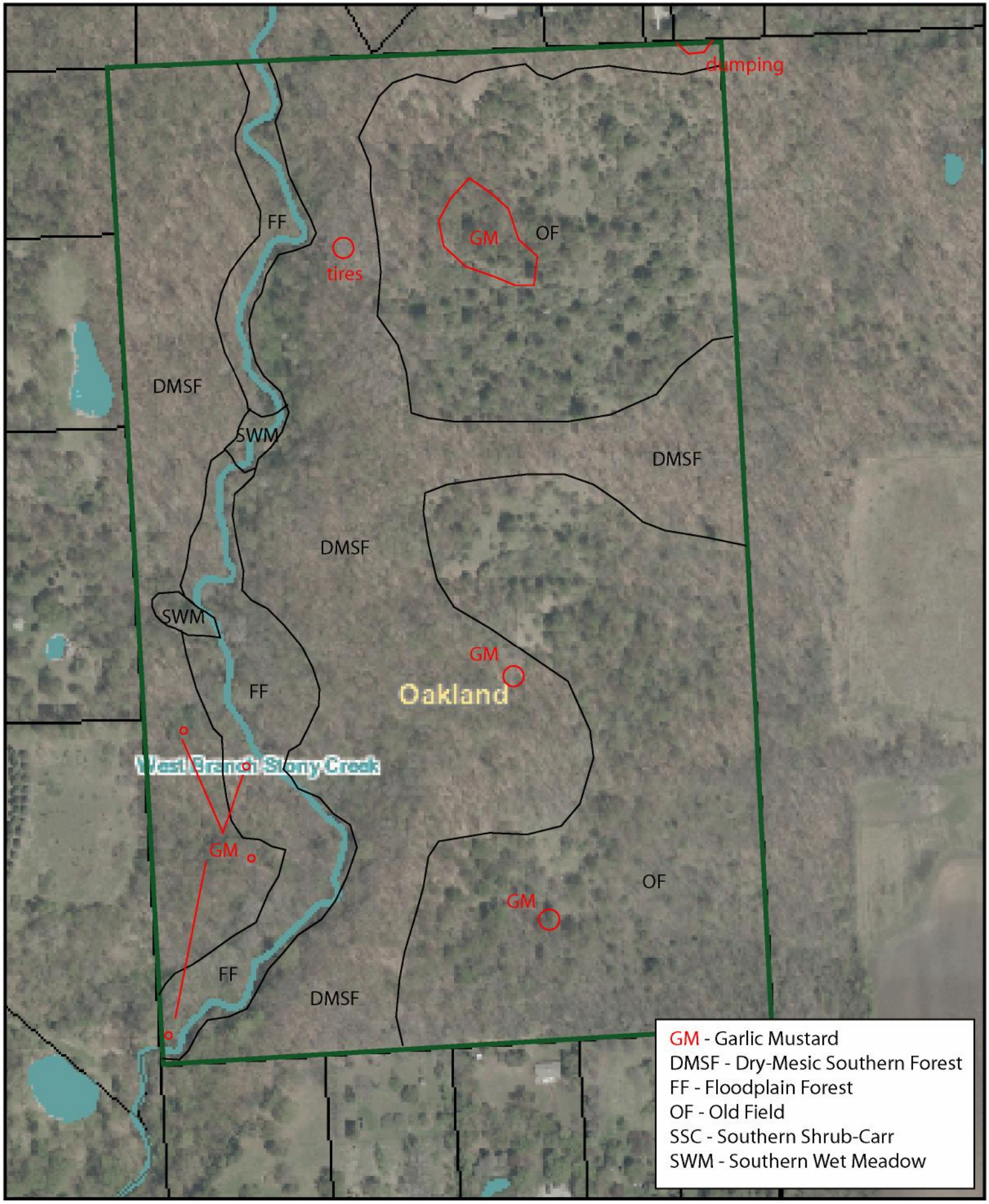
Stoney Creek Ravine Nature Park - Current Plant Communities

Plantwise, LLC 2009



Stoney Creek Ravine Nature Park - Habitat and Soil Type

Plantwise, LLC 2009



Stoney Creek Ravine Nature Park - Plant Communities and Invasives

Plantwise, LLC 2009

Stony Creek Ravine Nature Park

East Addition

Maintenance Plan

Benjamin VanderWeide, Natural Areas Stewardship Manager
Doug Caruso, Maintenance Foreman
Oakland Township Parks and Recreation

March 2015

Table of Contents

Contents

Overall Observations and Site Description

Like the existing Stony Creek Ravine Nature Park, the potential 209 acre addition to the eastern end is a mixture of higher quality and degraded areas. Some steep and rolling topography is found in the northeast corner and south-central area of the property, but most of the property is relatively flat with poorly drained soils. Aerial photographs reveal that at least 175 acres of this parcel had been farmed since before 1940. Later aerial photographs indicate that agriculture ceased on approximately 115 acres of those fields in the 1980s, while 60 acres were still being actively farmed in 2014. This extensive agricultural history has destroyed the natural wetland and upland communities that used to be present those areas. However, since agriculture ceased relatively recently in the old fields, dense populations of invasive plants have not yet established in these areas.

High quality mesic and wet-mesic southern forest is found in the northwest and east central portion of the property. The northeast wet-mesic southern forest was surveyed by Paul Thompson in 1974 as part of his ecological survey of Oakland Township. Thompson recommended that this forest (W-63), the forest along Stony Creek (W-64, currently in the existing Stony Creek Ravine Nature Park), and an adjacent forest north of this property (W-58 and W-59) be set aside to preserve and example of beech-maple forests in the township.

> *The very high upland area lying between W-63 and W-64 offers excellent scenic outlooks to the south and east with a very good view of Stony Creek Lake. The area has other potentials for recreation. The ground slopes steeply to the southeast. As W-63 is only one of two wooded tracts -- excluding a woodland (W-65) located in Stony Creek Park -- in the township containing stands of beech and sugar maple, it would be desirable to preserve this area, including the adjoining similar tract W-58. Since W-63, W-64 and F-5 lie adjacent to one another, this offers an interesting combination of natural features which would be worth preserving. Such action would preserve the rugged slopes of F-5 and keep intact the forested slopes of W-64 which if disturbed would be subject to severe erosion, with the resultant silting of the valley stream (S-12). It would further offer protection to the natural vegetation of the floodplain of W-64, and retain a portion of the valuable scenic features of the township* (Thompson 1974).

Adding this 209 acre parcel to the existing Stony Creek Ravine Nature Park would protect most of the critical area that Thompson originally identified. Protecting this property also increases habitat connectivity between the natural areas in the Huron-Clinton Metropolitan Authority's Stony Creek Metropark and the natural areas in Oakland Township's existing Stony Creek Ravine Nature Park. The many wetlands on this parcel flow into the McClure Drain, which then flows into the reservoir in Stony Creek Metropark created by damming the east and west branches of Stony Creek. Protecting the wetlands on this property would help ensure water quality for these aquatic systems and for the wildlife and plants within those areas.

Overall Goals and Intended Site Uses

The main goal for this property from a natural areas perspective is to preserve the high quality natural features and to preserve and restore wetlands where they have been modified by agriculture. The soils in much of the park are poorly drained and could cause drainage challenges if park developments and trails are not located with care. Any development intended for high-

volume usage in the park should be concentrated in one area to maximize the area of the park that can function as a biological corridor.

Soils

Areas of poor and very poorly drained Sebawa loam, Sloan silt loam, and Houghton or Adrian muck soils are found on the northern part of the property. The soils on the remainder of the property are mostly Fox and Matheron sandy loams that vary in their wetness and slope. Soils in the northwest and south-central portion of the property are made up of the Fox sandy loam soil type. These sandy loam soils are well-drained and generally found on side slopes, knolls, and ridges (Feenstra 1982). The Fox soils are gently to moderately sloped in the south-central area of the property, but strongly sloped in the northwest area. Soils in the central and southern part of the property are predominately Matheron sandy loam soils. Matheron sandy loam soils are nearly level and somewhat poorly drained, making these soils difficult to build on and more suited to natural areas than development (Feenstra 1982). Other types of sandy loam soils are interspersed with the Fox and Matheron soils. **See Map 1.**

Pre-Settlement Condition

Pre-settlement plant communities of the east addition property were primarily mixed oak forests, black oak barrens, and wet prairie. Pre-settlement refers to the time before settlement by immigrants of European descent in the early 1800s. The best estimate of pre-settlement vegetation in Oakland Township was made by Michigan Natural Features Inventory scientists using original notes from the 1817 General Land Office survey of the township by Joseph Wampler, soils information, and current vegetation. The pre-settlement vegetation maps that resulted from this effort indicate broad patterns of the distribution of plant communities. Wetlands and smaller pockets of other plant communities were no doubt interspersed with the dominant plant communities. **See Map 2.**

Before European settlement southeast Michigan was inhabited by native people who exerted significant influence on the natural communities through their agricultural practices and use of prescribed fire. Lightning was probably also an important ignition source for fire. Over this limited area, soils and hydrology are the primary factors determining the abundance and spatial distribution of plant communities. However, fire historically maintained areas that would have been closed-canopy forests as more open, fire-dependent communities. These fire-dependent communities with low tree density were widespread in Oakland Township before European settlement and included prairies, oak barrens, and oak savannas.

Mixed oak forests were dominated by black and white oaks, with minor components of other trees such as black cherry, pignut hickory, and sassafras. Frequently found adjacent to black oak barrens, they represented a slightly less fire-prone habitat, yet they were drier and more fire-prone than oak-hickory forests. The largest concentration of this habitat type occurred on sandy plains and sandy, rolling ridges in the southeast Michigan counties of Macomb, Oakland, Washtenaw, Livingston, and Jackson. Mixed oak forests made up 1.1% of Michigan's landforms (Plantwise 2010).

Black oak barrens comprised about 1.9% of Michigan's landscape at the time of the original surveys of Michigan. They were found on flat plains and rolling, gravelly hills on the interior portion of the southern Lower Peninsula, and probably burned quite frequently. Oakland County historically contained more black oak barren than any other county. The typical dominant tree was black oak, but Northern pin oak, white oak, and scarlet oak were also found. Prairie grasses and forbs were common in these savannas. Because of the absence of trees, much of this habitat was converted to farmland, but mostly abandoned in the 1930s because of the droughty and infertile soils. Much of this habitat that remains is in the process of succeeding to a closed-canopy oak forest, due to the lack of fire (Plantwise 2010).

Inland **wet prairie** comprised about 0.3% of Michigan's plant communities before European settlement, primarily in the southern lower peninsula. Most of the inland wet prairie was found in Jackson County, but was also present in Oakland County. These wet grasslands occurred adjacent to lakes, rivers, streams, and wetlands and in shallow depressions. Prairie cordgrass and bluejoint grass are the dominant plant species, with sedges, prairie grasses, and a diverse array of forbs interspersed. Very low tree densities were maintained by frequent fire and seasonal inundation. Most wet prairies were drained and converted to agriculture soon after settlement, leading to dramatic losses of this plant community. Fire suppression led to further degradation and loss of remaining wet prairies (Slaughter and Kost 2010).

Current Plant Communities

Most of current natural communities of the property reflect the agricultural history of the site, with higher quality remnants in areas that were not converted to agriculture. Given the rapid pace of habitat fragmentation in the area due to development, the natural communities on this property serve an important role as a biological corridor connecting natural communities in Stony Creek Metropark to communities to the north, including the existing Stony Creek Ravine Nature Park. In particular, broad-scale wetland mitigation on this property would introduce important breeding and migratory habitat for waterfowl and other birds in areas that currently have little habitat value. **See Map 3.**

Dry-mesic southern forest occupies a small area with steep topography in the northwest corner of the property. Black oak and white oak are typically common in these areas. Autumn olive, Oriental bittersweet, and other invasive shrubs form extensive thickets in the adjacent portion of the existing Stony Creek Ravine Nature Park and are established in the understory of this area. These shrubs should be removed, working first in the highest quality areas.

The **mesic/wet-mesic southern forest** in the northeast was surveyed by Paul

Thompson in 1974 as part of his ecological survey of Oakland Township. He described the forest (W-63 in his notation) as follows:

> *This is a low, wet, mixed woods composed of large trees. Both swamp forest species and beech and sugar maple are represented to give a diverse collection of various species of trees. A very rich, excellent spring flora thickly covers the forest floor. The many low wet areas mixed with slightly higher hummocks lead to a diverse collection of ground species similar to W-47 but lack the stands of red trillium that latter tract possesses. Ferns are plentiful in this moist habitat. A small stream winds through the northern portion of the woods flowing eastward and then southward near its eastern border* (Thompson 1974).

Observations from a spring 2014 visit to this forest (W-63) revealed that its natural features appeared to still be largely intact, with abundant spring ephemeral wildflowers, vernal pools, and spicebush in the understory. Problems noted during that visit include oriental bittersweet that had established on the edge of the woodland and there was evidence of recent selective logging. In the short-term this forest will need immediate control of oriental bittersweet to prevent further infestation. In the long-term the adjacent old fields should be allowed to succeed to wet-mesic southern forest to buffer the high-quality interior forest from invasion by exotic plant species.

Observations from a spring 2014 visit to this forest (W-63) revealed much its natural features appeared to still be intact, although oriental bittersweet had established on the edge of the woodland and there was evidence of some recent logging. A pocket of **mesic southern forest** in the east-central area of the property was present in the 1940s aerial photograph of the property and likely contains high quality plant communities. **See Map 4.**

A large portion of this property, 115 acres, is former agricultural land and is classified as **old field**. Aerial photographs indicate that old fields in the existing Stony Creek Ravine Nature Park were only in active agriculture until the 1950s, most likely due to the droughty soils and rolling topography in that area. In contrast, the old fields in this property appear to have been farmed until the 1990s in some areas and the mid-2000s in others. Approximately 60 acres of the property were active **agricultural fields** in 2014. While the recent agricultural history has prevented re-colonization of native plant species, it has also limited the establishment of invasive plants.

With extensive existing wetlands and poorly drained soils, these fields are excellent locations for wetland restoration. In the concept plans for this property, three wetland mitigation banking areas are planned for approximately 50 acres of these fields. Any drain tiles remaining after the wetland mitigation work should be broken to restore the hydrology of the site. Retaining water on site would increase water storage capacity, helping prevent excessive nutrient pollution and sediment in storm water runoff from the site.

Old fields not included in the wetland mitigation should be converted to native vegetation in phases. Since the pre-settlement vegetation map show wet prairie on the eastern portion of the property, it would be appropriate to restore wet prairie and mesic prairie to the site. To prevent establishment of invasive plant species, fields should remain in active agriculture or be mowed annually until being planted to native vegetation.

Surrounding Land Uses

The entire western boundary of this site is the existing Stony Creek Ravine Nature Park. Most of the southern boundary of the park is occupied by Stony Creek Metropark across Snell Road. The habitat value of this parcel is greatly enhanced by these two existing protected areas. Large residential lots border the property on part of the south boundary, the eastern boundary, and the northern boundary. Despite residential development, a 55 acre forested area buffers the property to the north. Natural areas problems from residential development include yard waste dumps, off-road vehicle use, and invasive plant species introductions. Areas adjacent to residential development require more thorough annual monitoring.

Site Concerns and Prioritization

1. Oriental bittersweet (*Celastus orbiculatus*) is well-established in the existing Stony Creek Ravine Nature Park. Given the extensive agricultural disturbance on this property, Oriental bittersweet has the potential to establish and spread quickly. Oriental bittersweet should be managed aggressively, beginning in the high-quality forest in the northwest corner of the property. Where thorough control efforts must be delayed, large bittersweet plants should be controlled to prevent seed production.
2. Small patches of Phragmites have established in the old fields. Phragmites should be managed aggressively to remove existing infestations and to prevent spread into wetland mitigation projects. The bare soil of the agricultural fields will facilitate rapid establishment and spread of Phragmites if it is not controlled.
3. Non-native shrubs should not be allowed to establish in old fields. Old fields should be mowed annually until they are planted to native vegetation.
4. Deer densities in the existing Stony Creek Ravine Nature Park were estimated to be 427 deer/sq. mile and 182 deer/sq. mile in aerial surveys conducted in January 2014 and 2015, respectively. Michigan Natural Features Inventory Biologists recommend 15-20 deer per square mile to promote functional natural communities. Control measures will need to be taken to reduce deer damage to the natural communities, not to mention the threats to human health related to vehicle crash and tick-borne diseases.
5. Re-introduction of fire to fire-dependent communities. The oak forests, wet prairie, sedge meadows, and other natural communities that historically existed on the site were maintained by periodic fire. As native communities are restored to the site, prescribed fire should be used as a management tool where appropriate.

Natural Area Stewardship Management Actions

1. Aggressively manage Oriental bittersweet. For the first few years sweep the property three times during the growing season.

2. Aggressively manage Phragmites. This should include annual treatment of existing infestations and thorough monitoring of the remaining areas of the park.
3. Control reed canary grass in old fields and wetland areas.
4. Sweep upland areas of the property annually for garlic mustard. Hand pull second-year plants in high quality areas. In low-quality areas spray rosettes in late fall or early spring.
5. Mow old fields annually until conversion to restored wetland or prairie. This will prevent establishment of invasive shrub species.
6. It is vital to establish a deer management program to prevent damage to understory and groundcover vegetation.
7. Restore old field and agricultural fields to functional natural communities. This will require breaking drain tiles to restore hydrology and planting native vegetation.

Natural Area Stewardship Monitoring Recommendations

1. Conduct biological surveys of the property. A thorough botanical survey of the property should be prioritized. Good information about the plants and animals present on the property is needed to property manage the natural areas.
2. Establish photo-monitoring points to track ecological succession and the progress of invasive species control efforts.
3. Establish deer exclosures in high-quality areas to understand the effects of high deer densities on plant communities.

Natural Areas Stewardship Resource Allocation

Table 1. Annual allocation of staff time and supplies to natural areas management

Task	Estimated Annual Staff Hours	Estimated Staff Cost @ 15/hr	Estimated Annual Supplies Budget	Total
Oriental bittersweet control	200	$3000	$300	$3300
Garlic mustard control	80	$1200	$50	$1250
Phragmites control	25	$375	$50	$425
Control reed canary grass	25	$375	$25	$400
Other invasive species control	25	$375	$25	$400
Photo monitoring	5	$75	$25	$100
Biological surveys	25	$375	$25	$400
Deer exclosure construction/ monitoring	25	$375	$1000	$1375
Seeding native plants	40	$600	$5000	$5600
Mowing old fields	100	$1500	$300	$1800
Total	**555 hours**	**$8325**	**$6800**	**$15,125**

Proposed Recreation and Support Facilities

Recreation and support facilities proposed for the expansion area include the park entry road, 30-space parking lot, trail head, play structure, and 2.32 mile multi-use trail system which are shown on the attached Preliminary Site Development Plan. These amenities are proposed to be similar in materials, scope, and required maintenance to the existing facilities located at Oakland Township's Bear Creek Nature Park. Recommended maintenance actions, required resources and associated annual costs for the proposed expansion area are listed below.

Recreation and Support Facility Maintenance Actions

1. Maintain play scape including weekly and annual inspections, annual fibar surface additions and 10 year replacement, replacing play scape hardware and cleaning play equipment.
2. Mowing trails, lawn area around play structure and along entrance driveway and parking lot.
3. Litter control including weekly garbage and poop bag removal and one annual park wide clean up.
4. Snow removal including parking lot and entrance driveway.
5. Maintain gravel parking areas including grading and filling.
6. Portable toilet 6 months of the year.
7. Park and trail inspections.

Recreation and Support Facility Maintenance Resource Allocation

Table 2. Annual allocation of labor and supplies for facility maintenance

Task	**Estimated Contractor Cost**	**Estimated Annual Staff Hours**	**Estimated Staff Cost @ 15/hr**	**Estimated Annual Supplies Budget**	**Total**
Maintain Play scape		200	$3000	$1200	$4200
Mowing trails and lawn areas	$2500				$2500
Litter control		40	$600	$250	$850
Snow removal		20	$300		$300
Maintain gravel parking areas		18	$270	$250	$520
Portable toilet	$850				$850
Park and trail inspections		50	$750		$750
TOTAL	**$3350**	**328**	**$4920**	**$1700**	**$9,970**

References

Feenstra, JE. 1982. Soil survey of Oakland County, Michigan. US Department of Agriculture Soil Conservation Service. 167 pp. + maps.

U.S. General Land Office. Michigan Public Land Survey Records: Original Field Notes. Online copy at: http://seekingmichigan.org. Accessed 17 February 2015.

Mindell, D & M Demmon. 2010. Stony Creek Ravine Nature Park comprehensive management plan. 15 pp. Plantwise LLC.

Slaughter, BS and MA Kost. 2010. Natural community abstract for wet prairie. Michigan Natural Features Inventory, Lansing, MI. 12 pp.

Thompson, P. 1974. An ecological survey of Oakland Township, Oakland County, Michigan. Cranbrook Institute of Science.

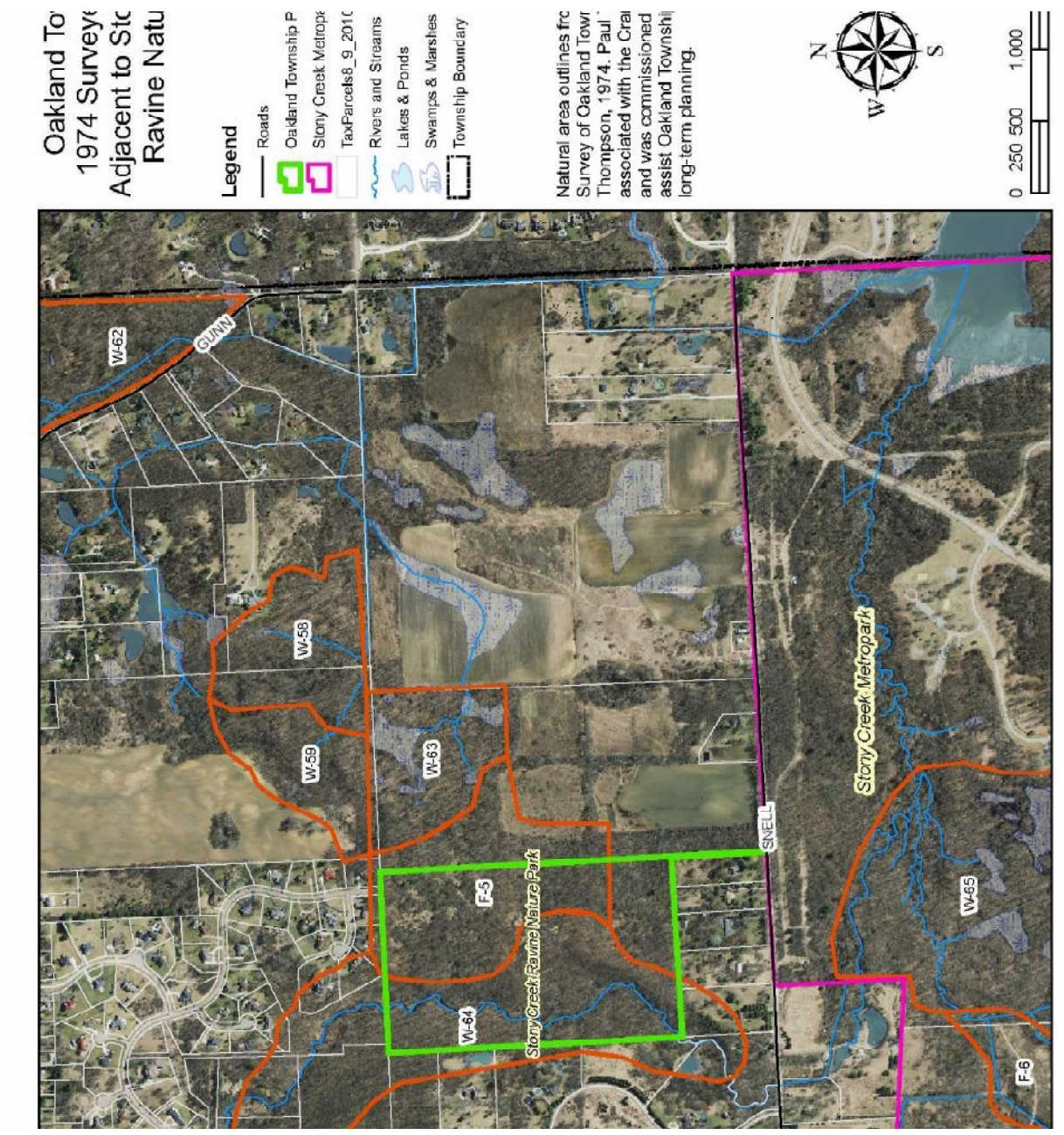
Maps

1. Soils
2. Pre-settlement vegetation
3. Natural communities
4. Thompson 1974 Survey Areas Near Stony Creek Ravine Nature Park
5. Stony Creek Ravine Nature Park Expansion Preliminary Site Development Plan

CREEKVIEW
SNELL
Stony Creek Ravine Nature Park
Stony Creek Metropark
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles
Streams
Wetlands
Proposed Addition
Existing Township Park
Stony Creek Metropark
Soils
10B - Marlette sandy loam 1-6% slopes
11B - Capac sandy loam 0-4% slopes
13B - Oshtemo-Boyer loamy sands 0-6% slope
15C - Spinks loamy sand 6-12% slope
18C - Fox sandy loam 6-12% slope
18D - Fox sandy loam 12-25% slope
19 - Sebewa loam
26 - Sloan silt loam
27 - Houghton & Adrian mucks
44C - Ridgles sandy loam 6-12% slope
44D - Ridgles sandy loam 12-18% slope
54A - Matherton sandy loam 0-3% slopes
68 - Conover-Fox association
water

MIXED OAK FOREST
BLACK OAK BARREN
Stony Creek Ravine Nature Park
SNELL
Stony Creek Metropark
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles
Presettlement Vegetation
BLACK OAK BARREN
MIXED OAK FOREST
WET PRAIRIE
Streams
Wetlands
Proposed Addition
Existing Township Park
Stony Creek Metropark

KNOB CREEK
SNELL
Stony Creek Ravine Nature Park
Stony Creek Metropark
Mesic/Wet-Mesic Southern Forest
Dry-Mesic Southern Forest
Old Field
Agricultural Field
Floodplain Forest
Southern Wet Meadow
Southern Shrub-Carr
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles
Streams
Wetlands
Proposed Addition
Existing Township Park
Stony Creek Metropark
Agricultural Field
Dry-Mesic Southern Forest
Emergent Marsh
Floodplain Forest
Mesic Southern Forest
Mesic/Wet-Mesic Southern Forest
Old Field
Southern Shrub-Carr
Southern Wet Meadow
reek Ravine
ure Park
t Addition
Communities


Oakland To
1974 Survey
Adjacent to Sto
Ravine Natu
Legend
Roads
Oakland Township P
Stony Creek Metropa
TaxParcels8_9_201(
Rivers and Streams
Lakes & Ponds
Swamps & Marshes
Township Boundary
Natural area outlines fro
Survey of Oakland Town
Thompson, 1974. Paul
associated with the Cra
and was commissioned
assist Oakland Townshi
long-term planning.
N
W
S
0 250 500 1,000
W-62
GUNN
W-58
W-59
W-63
W-64
F-5
Stony Creek Ravine Nature Park
SNELL
Stony Creek Metropark
W-65
F-6

Site Development Plan
TF 15-0
Oakland County
Single-Family Residential
Wetland & Wildlife Habitat Restoration Basin C - 11 Ac.
Single-Family Residential
Key:
Emergent Wetland per National Wetland Map
Forested Wetland per National Wetland Map
Bermed Wetland & Wildlife Habitat Restoration Area
Trail
Stream
Views
Recreated Biological Corridor
Untouched Forest
Wetland & Wildlife Habitat Restoration Basin A - 23 Ac.
Wetland & Wildlife Habitat Restoration Basin B - 15 Ac.
Wetland & Wildlife Habitat Restoration Interpretive Trail Loop
Sledding Hill
Biological Corridor
Champion Tree
Open Area for Active Recreation
Play Structure
Trail Connection to Stony Creek Metro Park
Proposed Multi-Use Trails (2.32 Miles)
Trail Head
Entry Area & Parking
Snell Road
Stony Creek Metro Park
Stony Creek Ravine Park Expansion Project Boundary
Interpretive Signs
Zoned Single-Family Residential
Potential Trail Connection to Gunn Road
Forested Area
Beech-Sugar Maple Woods
Scenic Views from High Elevation
Knob
Geocaching
Proposed Observation & Fishing Platform
Existing Stony Creek Ravine Nature Park
Proposed Observation & Fishing Platform
Proposed Scenic Overlook
Single-Family Residential
Dry-Mesic Southern Forest
Existing Multi-Use Trails (0.54 Miles)
Stony Creek
Proposed Safety Path Connection
Not to Scale
Tax Parcel
2014 Aerial
Stony Creek Ravine Nature Park Expansion
Oakland Township
Stony Creek Ravine Nature Park Expansion
• 2015 Natural Resources Trust Fund Grant • Michigan Department of Natural Resources •
Map provided by
and
Donald C. Kostichal Assoc

MANAGEMENT PLAN
November 21, 2007
Updated March 13, 2008

KEZLARIAN-ISRAELIAN CONSERVATION EASEMENT

Oakland Township
Oakland County

SUMMARY

This Management Plan has been prepared in conjunction with a Conservation Easement granted to the Oakland Land Conservancy by the Kezlarian family and in cooperation with Oakland Township Parks & Recreation. The Conservation Easement covers approximately 36 acres of land in Oakland Township, Michigan. Conservation Easement Permitted Uses Section 5.E. Property Management Plan specifies that the "Owner and Conservancy have agreed to mutually develop a written Management Plan for the Property. The Management Plan details proposed management and use of the Property in keeping with the Conservation Values and Purposes of this Conservation Agreement." This Management Plan consists of 17 pages and includes a cover page, a location and site map, a list of conservation goals and a timeline of recommended management. By signing the Management Agreement on page 3, the Owner agrees to manage the Property in accordance with the Management Plan. All referenced documents are permanently filed in the Oakland Land Conservancy Geographic Files.

Oakland Land Conservancy
P.O. Box 80902
Rochester, Michigan 48308-0902
(248) 601-2816
www.oaklandlandconservancy.org

Table of Contents

SECTION I. MANAGEMENT AGREEMENT

This Management Plan has been prepared by the Oakland Land Conservancy and is currently under review by Oakland Township Parks & Recreation, and is effective starting DATE. This plan expires after five years and must be revised by DATE.

This Management Plan consists of 17 pages and includes a cover page, a location and site map, a list of conservation goals and a timeline of recommended management actions for the Kezlarian Property. Unless otherwise noted, information used to prepare this Plan was gathered from personal site tours, the Kezlarian Property Conservation Easement and Baseline Documentation Report. All of these documents are permanently filed in the Oakland Land Conservancy Geographic Files.

Owner and Conservancy acknowledge and agree to accept this Management Plan. Owner further agrees to manage the Protected Property, with Conservancy assistance, in accordance with this Management Plan. Both the Owner and the Conservancy agree to revise this Management Plan by DATE.

	OWNER		CONSERVANCY
By:	_____	By:	_____
	Becky McLogan Director Oakland Township Parks & Recreation		Donna Folland Executive Director Oakland Land Conservancy
Date:	_____	Date:	_____

SECTION II. PROPERTY DESCRIPTION

Location

The protected property comprises 36.16 acres of land located in Oakland Township, Oakland County, Michigan. The property is bordered by Knob Creek Farms Subdivision's conservation easement and residential property on the north, residential property on the east, south and west. Stony Creek Metropark is located south of the property, on the south side of Snell Road.

Access

Access to the property for monitoring and management purposes is from Knob Creek Road on the north side of the property or via pedestrian trail off Snell Road.

Property Restrictions

The following uses are prohibited on the property (refer to Conservation Easement for details):

- Division or subdivision
- Commercial activities
- Industrial activities
- Construction, except as permitted under Reserved Rights and Approvals
- Cutting of vegetation, living or dead, except for reasons of safety or as permitted in approved Management Plan
- Land surface and subsurface alteration
- Dumping
- Alteration of water courses
- Use of motorized vehicles, except as permitted under Reserved Rights and Approvals
- Signs and billboards, with certain exceptions

Reserved Rights and Approvals

The following rights are reserved by the owner of the property (refer to Conservation Easement for details):

- Right to manage property for passive recreation
- Right to convey property
- Right to add structures or improvements with prior written approval of Conservancy
- Right to follow an approved property Management Plan
- Limited vehicular use as needed to manage property or respond to an emergency
- Right to install fences that do not interfere with the conservation values of the property
- Township may disturb conservation values to protect public health and safety if there is no feasible alternative

SECTION III. MANAGEMENT UNITS

Identification of Management Units

To help focus on-the-ground management the easement property has been divided into four management units (See attached map). Each unit has specific recommendations that when implemented as a whole will accomplish the maintenance of the viability of the floristic significance of the property's natural communities and ecosystems. These units are:

- Management Unit 1: Stream (N1 on Site Map)
- Management Unit 2: Riparian corridor (N3 and N4 on Site Map)
- Management Unit 3: Steep slopes (N2 on Site Map)
- Management Unit 4: Uplands (N5 of Site Map)

Main Goals

The main goals of these management units are to enhance and maintain floristic quality and keep invasive species at bay throughout all units. Management strategies included in each unit engage different partners, including municipalities, watershed councils, and the Metropark Authority. The goals and strategies outlined in this plan will be evaluated every 5 years and updated as needed.

Listed below are a number of broad goals for the easement property.

- Enhance quality throughout by reintroducing fire to the entire property
- Reduce/eliminate invasive plants
- Revert woodlands to an oak barren ecosystem through the use of prescribed fire and mechanical thinning
- Maintain/enhance floristic quality (especially for listed species)
- Maintain/enhance wildlife habitat (especially for listed species)
- Create educational workday opportunities for large groups and schools
- Avoid ecosystem fragmentation by pursuing protection of adjacent property
- Maintain/create a trail through woods and slopes for public use
- Maintain/create foot/biking trails as well as fishing and scenic overlook structures at strategic points along creek
- Involve neighbors in enjoying the preserve and in scientific endeavors

SECTION III A. MANAGEMENT UNIT 1: STREAM

Description of Management Unit

Over 2000 linear feet of the West Branch of Stony Creek runs through the western half of the property. The Michigan Department of Natural Resources considers Stony Creek a coldwater fishery, yet has ceased stocking brown trout in 1991, primarily due to limited access. On the Site Map in Section V, this unit is in the community labeled "N1".

Conservation Goals

- Protect quality of Stony Creek and Clinton River watershed

Stresses and Management Strategies

Stress 1 : Up-Stream development

- Support best management practices up-stream of property
- Assess stream quality on a regular basis in partnership with Clinton River Watershed Council (CRWC) Adopt-a-Stream program

Stress 2 : Degradation of streambank habitat

- Assess stream-bank habitat and perform habitat restoration
- In partnership with CRWC, perform necessary river alterations, as well as normal water quality and benthic surveys

SECTION III B. MANAGEMENT UNIT 2: RIPARIAN CORRIDOR

Description of Management Unit

The Southern Floodplain Forest is flooded in the spring. It is found along Stony Creek and is closely tied to the Southern Wet Meadow. It is dominated by basswood (*Tilia americana*), American elm (*Ulmus americana*) and hop hornbeam (*Carpinus caroliniana*). Skunk cabbage (*Symplocarpus foetidus*) is found in the wetter areas of the community. On the Site Map in Section V, this unit is the communities labeled "N3" and "N4" and parts of "N2".

The Southern Wet Meadow, found along Stony Creek is dominated by grasses and sedges. It is found in areas within the Southern Floodplain Forest. Dominant species include rice cut-grass (*Leersia oryzoides*), sedges (*Carex* spp.), Joe-Pye weed (*Eupatorium maculatum*), and broad-leaved cattail (*Typha latifolia*). An invasive plant, reed canary grass (*Phalaris arundinacea*) is found in the southern wet meadow.

A state-threatened species, Jacob's ladder (*Polemonium reptans*) was found on the west side of Stony Creek in a transitional area between the Dry-mesic Southern Forest and Southern Floodplain Forest. Approximately 120 plants were documented in this area.

Conservation Goals

- Maintain and/or enhance the quality and diversity of native ecosystems
- Protect quality of Stony Creek

Stresses and Management Strategies

Stress 1: Invasive plant populations

- Document the health and diversity of the corridor
- Document the status of non-native invasive plant populations
- Hold workdays to control invasive populations
- Plan prescribed fire regime for unit

Stress 2: Encroachment by property neighbors, such as trash dumping

- Engage park neighbors in any appropriate monitoring activities
- Communicate with owner when encroachment and dumping is observed and document these sightings
- If necessary, engage neighbors in appropriate strategies for removal of yard waste and hold workdays for clean-up

Stress 4: Excessive foot traffic and trampling

- Clearly designate/mark trails and footpaths in cooperation with Oakland Township Parks and Recreation
- Develop a partnership with Huron Clinton Metro Parks Authority (HCMA) to ensure trail connector maintenance
- Ensure that trails are directing traffic away from sensitive native plant populations
- Perform any necessary maintenance to trail markers

- Restrict side trails to foot traffic only, and include bike racks at the tops of slopes to encourage the public to obey these restrictions.
- Work in cooperation with HCMA to decide on a permeable surface material for main trail

Stress 5: Suppression of natural fire regime

- In cooperation with Oakland Township Parks and Recreation Commission, work to re-introduce prescribed fire to the property as a whole
- Perform annual visits to monitor fire effects

SECTION III C. MANAGEMENT UNIT 3: STEEP SLOPES

Description of Management Unit

The Dry-mesic Southern Forest is found on the steep slopes of the eastern half of the property. Oaks; White Oak (*Quercus alba*), Black Oak (*Q. velutina*), and Red Oak (*Q. rubra*), dominate the community, along with sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*). This unit is in the majority of the community labeled "N2" on the Site Map in Section V.

Conservation Goals

- Maintain and/or enhance the quality and diversity of native ecosystems
- Protect quality of Stony Creek

Stresses and Management Strategies

Stress 1: Non-native invasive plant populations

- Staff perform field ground work to document the health of native ecosystems and the extent of the impact of invasive plants
- Map locations and sizes of populations
- Hold volunteer workdays to control invasive plants during appropriate seasons

Stress 2: Trash dumping and encroachment

- Remove trash and engage park neighbors if necessary in appropriate means of yard waste disposal
- Document all observed instances of dumping and report to owner

Stress 3: Erosion on slopes

- Clearly designate and mark footpaths and trails in order to control traffic in cooperation with Oakland Township Parks and foster a partnership with HCMA
- Ensure that trails are directing traffic away from steep slopes whenever possible
- Perform necessary maintenance to trail markers

SECTION IIID. MANAGEMENT UNIT 4: UPLANDS

Description of Management Unit

The Second-growth Forest/Old Field is an area of disturbance found on the highest elevations in the eastern half of the property. Common species include black cherry (*Prunus serotina*) and black walnut (*Juglans nigra*). Autumn olive (*Elaeagnus umbellata*) is a common invasive species. This area also has species associated with hillside prairies and oak barrens, including little bluestem (*Schizachyrium scoparius*), bush clover (*Lespedeza capitata*) and goldenrods (*Solidago* spp.). On the Site Map in Section V, this unit is in the community labeled "N5".

Conservation Goals

- Enhance floral diversity
- Restoration of native natural community

Stresses and Management Strategies

Stress 1: Invasive plant populations

- Perform field studies to document relative health of native community and the extent of invasive plant populations
- Hold volunteer workdays to control invasive plant populations
- Begin prescribed fire program

Stress 2: Encroachment by neighbors, such as trash and dumping

- Invite neighbors to the annual monitoring inspection
- Document all instances of observed trash dumps and report to owner
- Hold workdays to clean up trash if necessary

Stress 3: Erosion

- Clearly designate and mark footpaths and trails in order to control traffic in cooperation with Oakland Township Parks and the HCMA
- Ensure that trails are directing traffic away from steep slopes in the uplands and areas of erosion concern
- Perform any necessary maintenance to trail markers
- Introduce a thriving native plant population by re-seeding or planting seedlings where appropriate

SECTION IV. MANAGEMENT ACTIONS AND TIMELINE

Communication Plan

Action	***Responsibility***
Support best management practices upstream of property	Conservancy/Parks
Invite park neighbors to annual monitoring inspection	Conservancy
Encourage the proper disposal of yard waste and other trash	Parks
Discuss the possibility of special event hunting on property	Conservancy/Parks
Perform basic trail maintenance in cooperation with all partners	OLC/Parks
Direct trail construction and plans to avoid sensitive areas	Parks

Spring Stewardship Plan

Action	***Responsibility***
Invite park neighbors to annual monitoring inspection	Conservancy
Document health and diversity of native ecosystems	Conservancy/CRWC
Document status of invasive plant populations	Conservancy
Document condition of conservation easement boundary markers	Conservancy
Document trash and dumping	Conservancy
Document trampling	Conservancy
Document condition of trail markers	Conservancy
Hold workdays for invasive plant control and trash pick-up	Parks/ Conservancy/ CRWC

Fall Stewardship Plan

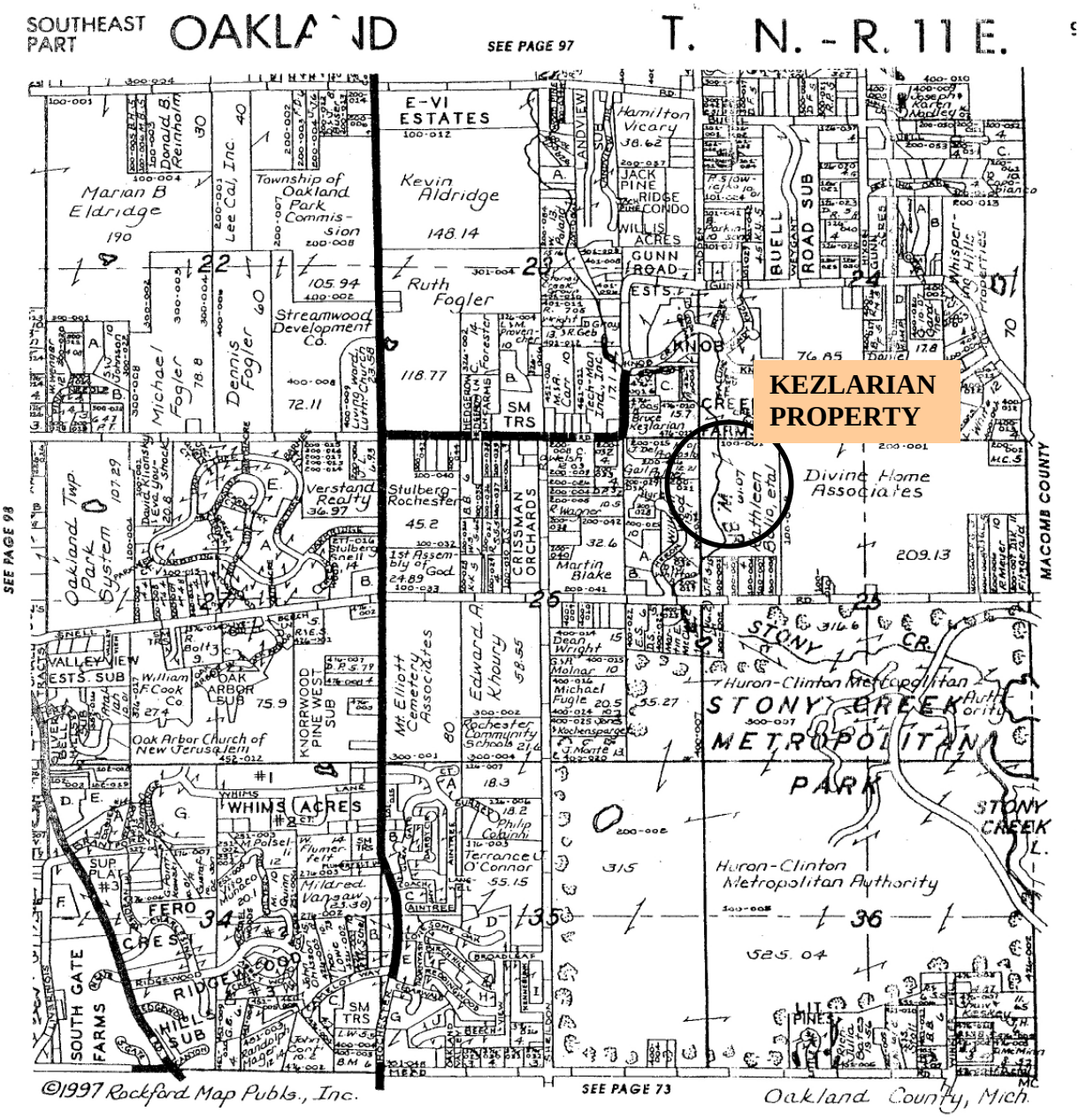
Action	***Responsibility***
Hold workdays for invasive plant removal and trash pick-up	Parks/ Conservancy
Document benthic species diversity (with CRWC Adopt-a-Stream program)	Parks/ Conservancy/ CRWC
Document water chemistry (with CRWC Adopt-a-Stream program)	Parks/ Conservancy/ CRWC
Document stream bank habitat quality (with CRWC Adopt-a-Stream program)	Parks/ Conservancy/ CRWC

Winter Stewardship Plan

Action	***Responsibility***
Document benthic species diversity (possible CRWC Stream-leaders)	Parks/ Conservancy/ Watershed Council
Document streambank habitat quality (possible CRWC Stream-leaders)	Parks/ Conservancy/ Watershed Council

SECTION V. MAPS

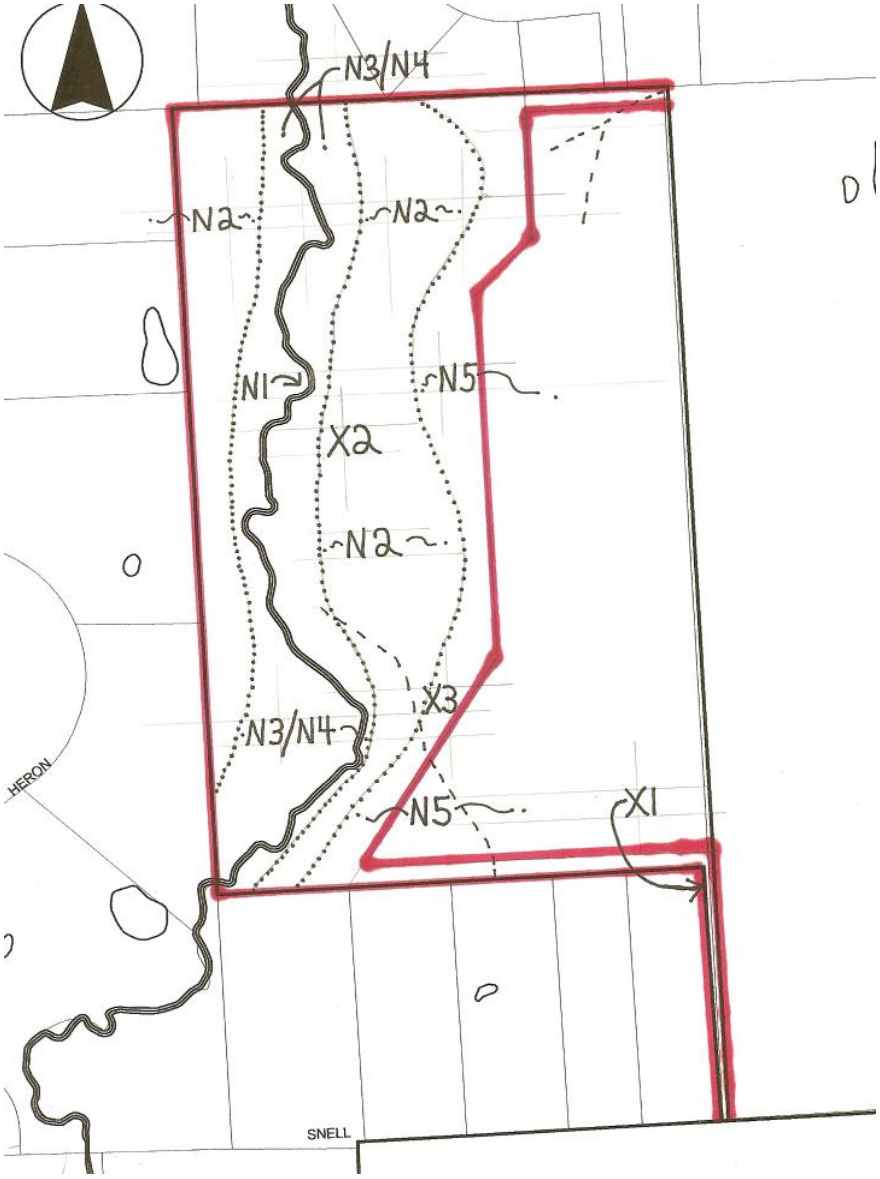
Map 1. Location Map



Map 2. Site Map (Not to Scale)

MAP LEGEND

N1 -	West Branch Stony Creek	X2 -	Tree stand
N2 -	Dry-Mesic Southern Forest	X3 -	Deer feed area
N3 -	Southern Floodplain Forest	————	Easement Boundary
N4 -	Southern Wet Meadow	- - - - - - - - -	Trail
N5 -	Old Field/Second Growth	.....	Approx. Ecosystem Boundary
X1 -	Wire fencing bale	x—x—x—x	Fence



SECTION VI. LIST OF STAKEHOLDERS

CURRENT Landowner: Children of Barkev and Nancy Israelian Kezlarian

Contact Name:	Bruce, Nancy and Barbara Kezlarian and Kathleen Kezlarian Bolio c/o Bruce Kezlarian		
Address:	680 East Gunn Road		
	Rochester, MI 48306		
Home Phone:		*Bus. Phone:*	
Email:		*Website:*	
Notes:	The property is owned by four siblings, Bruce, Nancy and Barbara Kezlarian and Kathleen Kezlarian Bolio. Bruce lives adjacent to the property and is the primary landowner contact.		

FUTURE Landowner:

Contact Name:	Melinda Milos-Dale		
Title:	Parks Director		
Company:	Oakland Township Parks & Recreation		
Address:	4393 Collins Road		
	Rochester, MI 48306		
Home Phone:		*Bus. Phone:*	
Email:	mmdale@oaklandtownship.org	*Website:*	www.oaklandtownship.org
Notes:			

Conservation Easement Holder:

Contact Name:	Donna Folland		
Title:	Executive Director		
Company:	Oakland Land Conservancy		
Address:	PO Box 80902		
	Rochester, MI 48308-0902		
Home Phone:		*Bus. Phone:*	(248) 601-2816
Email:	dfolland@oaklandlandconservancy.org		
Website:	www.oaklandlandconservancy.org		
Notes:			

Volunteer Steward:

Contact Name:	Carrie Krygel Young		
Address:	792 E. Gunn Road		
	Rochester, MI 48306		
Home Phone:	(248) 601-3576	*Bus. Phone:*	
Email:	cskrygel@robonomicon.com	*Website:*	
Notes:			

Watershed Council: CRWC

Contact Name:	Ted Bolak		
Title:	Stewardship Director		
Company:	Clinton River Watershed Council		
Address:	101 Main Street, Suite 100		
	Rochester, MI 48307		
Home Phone:		*Bus. Phone:*	(248) 601-0606
Email:	ted@crwc.org	*Website:*	www.crwc.org
Notes:			

Trails Partner: HCMA

Contact Name:	Paul Muelle		
Title:	Chief of Natural Resources		
Company:	Huron Clinton Metropark Authority		
Address:	13000 High Ridge Drive		
	Brighton, MI 48114-9058		
Home Phone:		*Bus. Phone:*	(800) 477-2757
Email:	paul.muelle@metroparks.com	*Website:*	www.metroparks.com
Notes:			

Grantor: Michigan Department of Environmental Quality

Contact Name:	Robert Sweet		
Title:			
	Environmental Science and Services Division		
Company:	Michigan Department of Environmental Quality		
Address:	Constitution Hall		
	525 West Allegan Street		
	PO Box 30457		
	Lansing, MI 48909-7957		
Home Phone:		*Bus. Phone:*	
Email:		*Website:*	
Notes:			

Grantor: Michigan Natural Resource Trust Fund

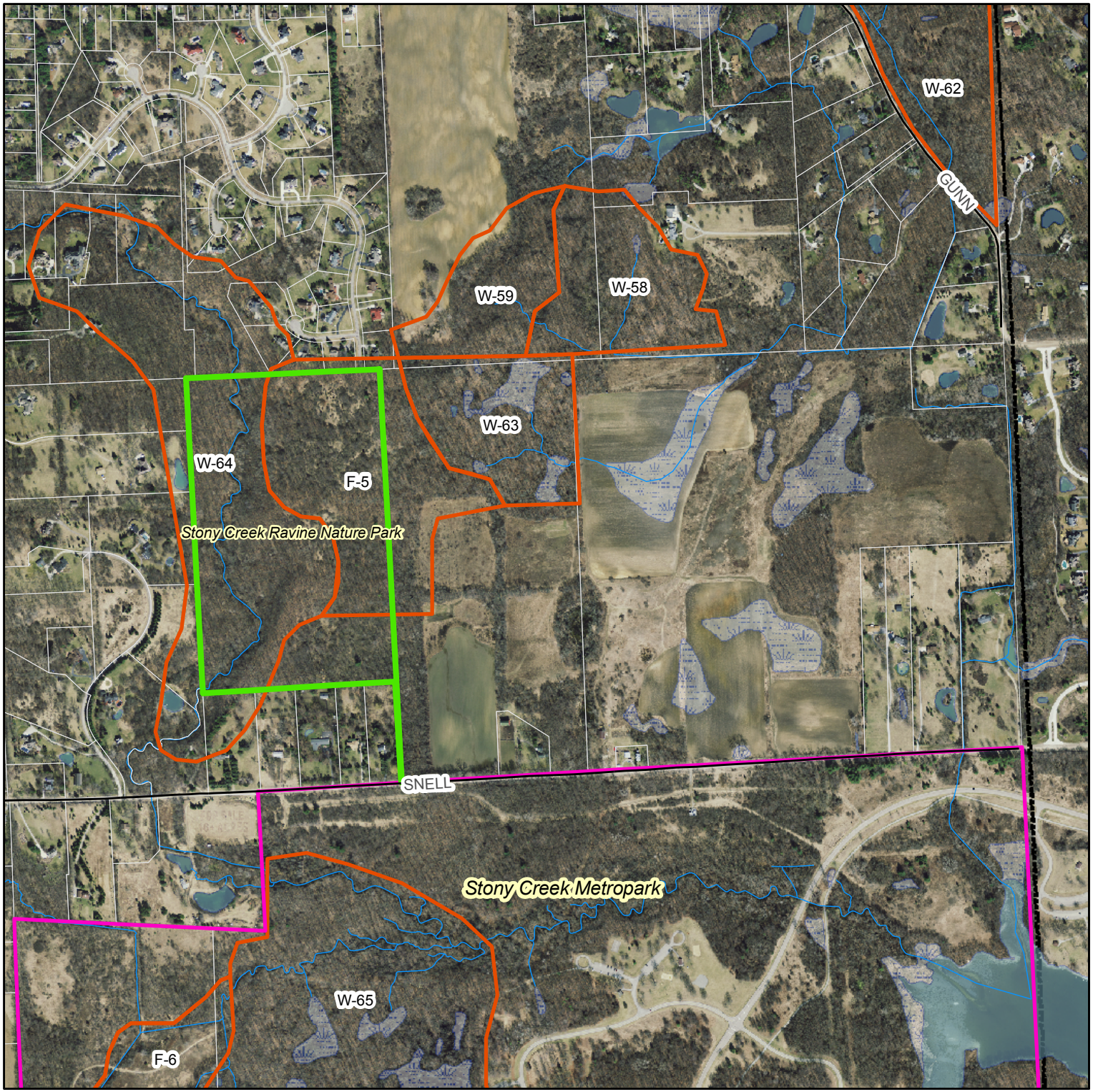
Contact Name:	Deborah Apostol		
Title:	Manager, Recreation Grants Unit		
	Grants, Contracts and Customer Systems		
Company:	Michigan Department of Natural Resources		
Address:	Steven T. Mason Building		
	PO Box 30425		
	Lansing, MI 48909-7925		
Home Phone:		*Bus. Phone:*	517-335-3046
Email:	apostold@michigan.gov	*Website:*	
Notes:			

Grantor: Community Foundation for Southeastern Michigan

Contact Name:	Tom Woiwode		
Title:	Director, GreenWays Initiative		
Company:	Community Foundation for Southeast Michigan		
Address:	333 West Fort Street, Suite 2010		
	Detroit, MI 48226-6675		
Home Phone:		*Bus. Phone:*	(313) 961-6675
Email:	twoiwode@cfsem.org	*Website:*	www.cfsem.org
Notes:			

Adjacent Landowners:

Name	*Street Address*	*Phone Number*	*Email*



Oakland Township 1974 Surveyed Areas Adjacent to Stony Creek Ravine Nature Park

Legend

- Roads
- Oakland Township Park
- Stony Creek Metropark
- TaxParcels8_9_2010
- Rivers and Streams
- Lakes & Ponds
- Swamps & Marshes
- Township Boundary

Natural area outlines from "Ecological Survey of Oakland Township" by Paul Thompson, 1974. Paul Thompson was associated with the Cranbrook Institute, and was commissioned to the survey to assist Oakland Township Parks with long-term planning.

N
W E
S

0 250 500 1,000 1,500 2,000
Feet

Oakland County Parks and Recreation
Natural Resources Management Program
Aerial Deer Survey Results - 2015

Last update on = 01/22/2015 by EL

2015 AERIAL DEER SURVEY RESULTS							OTHER OBSERVATIONS OF NOTE				
Day	Agency	PROPERTY	2015 Deer Count	Acreage (From CVT)	Sq. miles (acres/ 640)	2015 Densities per Sq. Mile (rounded-up)	Turkey Tally	Muskrat Huts	Coyote	Beaver Huts/Dams	Misc
01/15/15	OCPR	Addison Oaks - East	7	346	0.5404	13.00					
01/15/15	OCPR	Addison Oaks - Main	45	793	1.2395	37.00					
-	OCPR	**Addison Oaks - ALL**	52	1139	1.7799	30.00					
01/14/15	OCPR	Groveland Oaks	12	361	0.5647	22.00					
01/14/15	OCPR	Highland Oaks	6	303	0.4729	13.00			2	1 - Hut 1 - dam	
01/14/15	OCPR	Independence Oaks - Main	37	1094	1.7097	22.00	7			1 - Crooked Lake 1 - Spring Lake	
01/14/15	OCPR	Independence Oaks - North	2	187	0.2917	7.00					
-	OCPR	**Independence Oaks - ALL**	39	1281	2.0014	20.00					
01/14/15	OCPR	Lyon Oaks	44	1041	1.6258	28.00	4				
01/15/15	OCPR	Orion Oaks	19	913	1.4264	14.00	17			1 - hut	
01/14/15	OCPR	Rose Oaks	11	639	0.9979	12.00		1		1 - East of Esler Lake	
01/15/15	OCPR	Waterford Oaks	0	185	0.2893	0.00					
01/14/15	OCPR	Red Oaks Park	6	37	0.0582	104.00					
01/15/15	OTPR	OTPR - Bear Creek Nature Park	10	107	0.1672	60.00					
01/15/15	OTPR	OTPR - Blue Heron	8	139	0.2172	37.00					- two large wooden structures with track leading from northern private
01/15/15	OTPR	OTPR - Charles Ilsley	7	120	0.1875	38.00					
01/15/15	OTPR	OTPR - Draper Twin Lake Park	25	90	0.1406	178.00					1 - rabbit
01/15/15	OTPR	OTPR - Stony Creek Ravine	17	60	0.0938	182.00					
01/15/15	OTPR	OTPR - Watershed Ridge Preserve	27	170	0.2656	102.00					
01/15/15	ROCH HILLS	Rochester parcel 1	32	309	0.4827	67.00	9				
01/15/15	ROCH HILLS	Rochester parcel 2	56	120	0.1869	300.00					
01/15/15	ROCH HILLS	Rochester parcel 3	16	134	0.2096	77.00					
01/15/15	ROCH HILLS	Rochester parcel 4	3	140	0.2187	14.00					
01/15/15	ROCH HILLS	Rochester parcel 5	53	160	0.2501	212.00					
01/15/15	ROCH HILLS	Rochester parcel 6	21	210	0.3280	65.00					
01/15/15	ROCH HILLS	Rochester parcel 7	14	111	0.1737	81.00					
01/15/15	ROCH HILLS	Rochester parcel 8	13	215	0.3364	39.00					
01/15/15	ROCH HILLS	Rochester parcel 9	14	236	0.3681	39.00					
01/15/15	ROCH HILLS	Rochester parcel 10	22	93	0.1453	152.00	1				
01/14/15	SPG TWP	River Run Preserve	4	72	0.1125	36.00					
01/14/15	SPG TWP	Shiawassee Basin Preserve	26	540	0.8431	31.00					
01/14/15	WASH	Leonard Preserve	29	259	0.4047	72.00					
01/14/15	WASH	Horner (owned by U of M)	12	90	0.1406	86.00					
01/14/15	WASH	Marshall (owned by City of Ann Arbor)	5	79	0.1234	41.00					
01/14/15	WASH	Goodrich	4	36	0.0563	72.00					
01/14/15	WASH	Freeman Preserve	5	59	0.0922	55.00					
-	WASH	**ALL Goodrich Area Parcels**	26	264	0.4125	64.00					
01/14/15	WTR TWP	Hess-Hathaway	16	167	0.2609	62.00	6				
01/14/15	WTR TWP	OCC Highland Lakes	0	157	0.2453	0.00					1 - Red fox
01/14/15	WTR TWP	Vacant School Parcel	0	81	0.1266	0.00					
-	WTR TWP	All three properties	16	405	0.6328	26.00					
		TOTALS =	761	12941	20.2203	38.00					

The 2015 Oakland County Parks Aerial Deer Survey was conducted on January 14 and 15. The survey was flown during 4.5-7" snow-cover, 24-27F, partly cloudy conditions at an average altitude of 375 feet and 27 knots, over 9.6 hours of flight time. A total of nine Oakland County parks were surveyed. In addition, City of Rochester Hills, Waterford Township, Springfield Township, Washtenaw County and Oakland Township Parks and Recreation, partnered with OCPR to have key parcels within their jurisdictions surveyed (see above survey results). Michigan Natural Feature Inventory (MNFI) Biologists recommend deer densities of 15-20 deer per sq. mi. to promote the ecological health and function of natural communities.

OAKLAND COUNTY PARKS
Natural Resources Stewardship Program

Descriptions of areas near Stony Creek Ravine Nature Park surveyed in Thompson 1974, Ecological Survey of Oakland Township

W-58

This woodland, containing some very large trees, is a very rich and diverse forest. The southern portion is quite wet and contains a small stream which flows to the south. The rich and diverse ground cover of spring wildflowers makes the area particularly attractive. This tract should be preserved with the adjoining W-63 (which it resembles) as discussed below.

W-59

Severely cut, this woods lacks the richness of the above area [W58].

W-63

This is a low, wet, mixed woods composed of large trees. Both swamp forest species and beech and sugar maple are represented to give a diverse collection of various species of trees. A very rich, excellent spring flora thickly covers the forest floor. The many low wet areas mixed with slightly higher hummocks lead to a diverse collection of ground species similar to W-47 but lack the stands of red trillium that latter tract possesses. Ferns are plentiful in this moist habitat. A small stream winds through the northern portion of the woods flowing eastward and then southward near its eastern border.

W-64

Very high steep slopes mark the eastern border of Stony Creek as it flows through this section. The hillsides are protected by a covering of oak forest which is fairly dry because of drainage. The western border of the stream has lower banks with a sloping border of oak woods. The floodplain is fairly broad in this area and thickly carpeted with wetland and spring species of wildflowers. The rugged contours of the valley present scenic features which are well portrayed from the top of the high slopes. A portion of the wooded stream area extends into section 23 and the southwest corner of Section 24.

F-5

The very high upland area lying between W-63 and W-64 offers excellent scenic outlooks to the south and east with a very good view of Stony Creek Lake. The area has other potentials for recreation. The ground slopes steeply to the southeast. As W-63 is only one of two wooded tracts -- excluding a woodland (W-65) located in Stony Creek Park -- in the township containing stands of beech and sugar maple, it would be desirable to preserve this area, including the adjoining similar tract W-58. Since W-63, W-64 and F-5 lie adjacent to one another, this offers an interesting combination of natural features which would be worth preserving. Such action would preserve the rugged slopes of F-5 and keep intact the forested slopes of W-64 which if disturbed would be subject to severe erosion, with the resultant silting of the valley stream (S-12). It would further offer protection to the natural vegetation of the floodplain of W-64, and retain a portion of the valuable scenic features of the township.

Critical Area 3:

Because of the scarcity of beech-maple forests in the township, it would be desirable to give first consideration to the acquisition of such areas in the initial planning stages (oak forests are much more plentiful in the township). Only three such areas were located in the survey. One of these (W-65) (Section 36) is located in Stony Creek Park and its preservation by the Huron-Clinton Metropolitan Authority should he advocated. The best of the two remaining areas is located in the northern sector (W-47)(Section 2) near Romeo and Rochester Roads. It is a very rich woods, containing a number of woodland ponds and water- ways. It possesses an excellent spring wildflower flora and has a wide assortment of plants that would be useful to educational materials. *Rated second, but possessing many of the same qualities, is a low, wet woods (W-63)(Section 25) and (W-58)(Section 24) in the southern sector. This tract could be combined with a scenic outlook area (F-5) and a scenic stream valley (W-64)(Section 25) to form a small park which would have high scenic values, educational facilities and recreation possibilities.*

Green Infrastructure

TF15-0130

In 2009, a Green Infrastructure Vision was developed for Oakland County in order to identify areas in the landscape that are in need of local protection and link the remaining valuable ecological lands. These lands include large natural areas, important wildlife habitats, wetlands, riparian corridors, and areas that reflect key elements of Oakland County's biological diversity.

This locally driven initiative gathered input from a wide variety of stakeholders. In 2005, key stakeholders from Oakland Township participated in one of many work sessions focusing on natural resource connectivity. The area surrounding the proposed park has been identified as a key site and recreational link in the Green Infrastructure Vision.

What is Green Infrastructure?

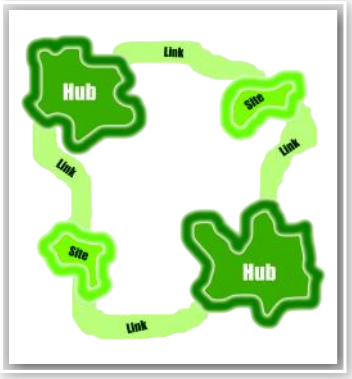
Green infrastructure is the interconnected network of open spaces, natural areas, and waterways. This network supports native species, maintains natural ecological processes, sustains air and water resources and contributes to health and quality of life. It also focuses on conservation values and the services provided by natural systems in concert with, instead of in opposition to, land development.

Benefits of Green Infrastructure

Green infrastructure provides a mechanism to identify and blend environmental and economic factors creating a multitude of social, economic, cultural and environmental benefits.

- Provides a sense of place and a unique identity
- Decreases cost of public infrastructure (i.e. stormwater management & water treatment systems)
- Increases both active and passive recreational opportunities
- Increases property values
- Helps preserve the unique quality of life
- Maintains the naturally functioning ecosystems
- Helps to attract new businesses and well qualified workers

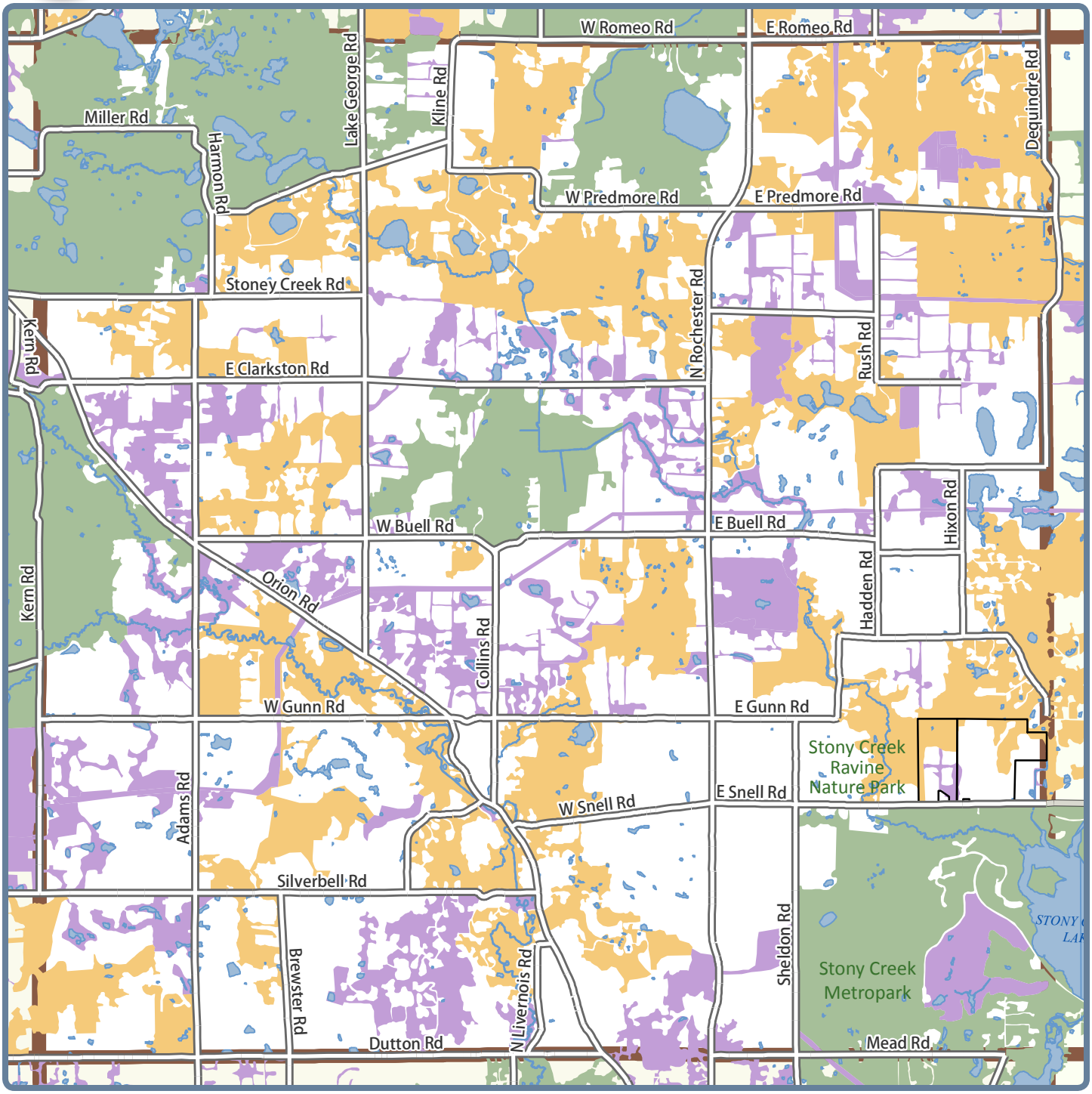
Components of a Green Infrastructure Network



- Hubs: Hubs anchor the network and provide an origin or destination for wildlife. Hubs range in size from large conservation areas to smaller parks and preserves. Hubs provide habitat for native wildlife and help maintain natural ecological processes.
- Sites: Smaller ecological landscape features that can serve as a point of origin or destination or include less extensive ecological important areas.
- Links: The connections that hold the network together and enable it to function. Links facilitate movement from one hub to another.

Green Infrastructure Map

TF15-0130



Road
Municipal Boundary
Lake or River
Area of Interest

Hub
Site
Link

Distance in Miles
0 1 2

Proposed park is located near:
1395 E Snell Rd, Rochester, MI 48306
42°44'02.9"N 83°06'36.0"W

Oakland Township

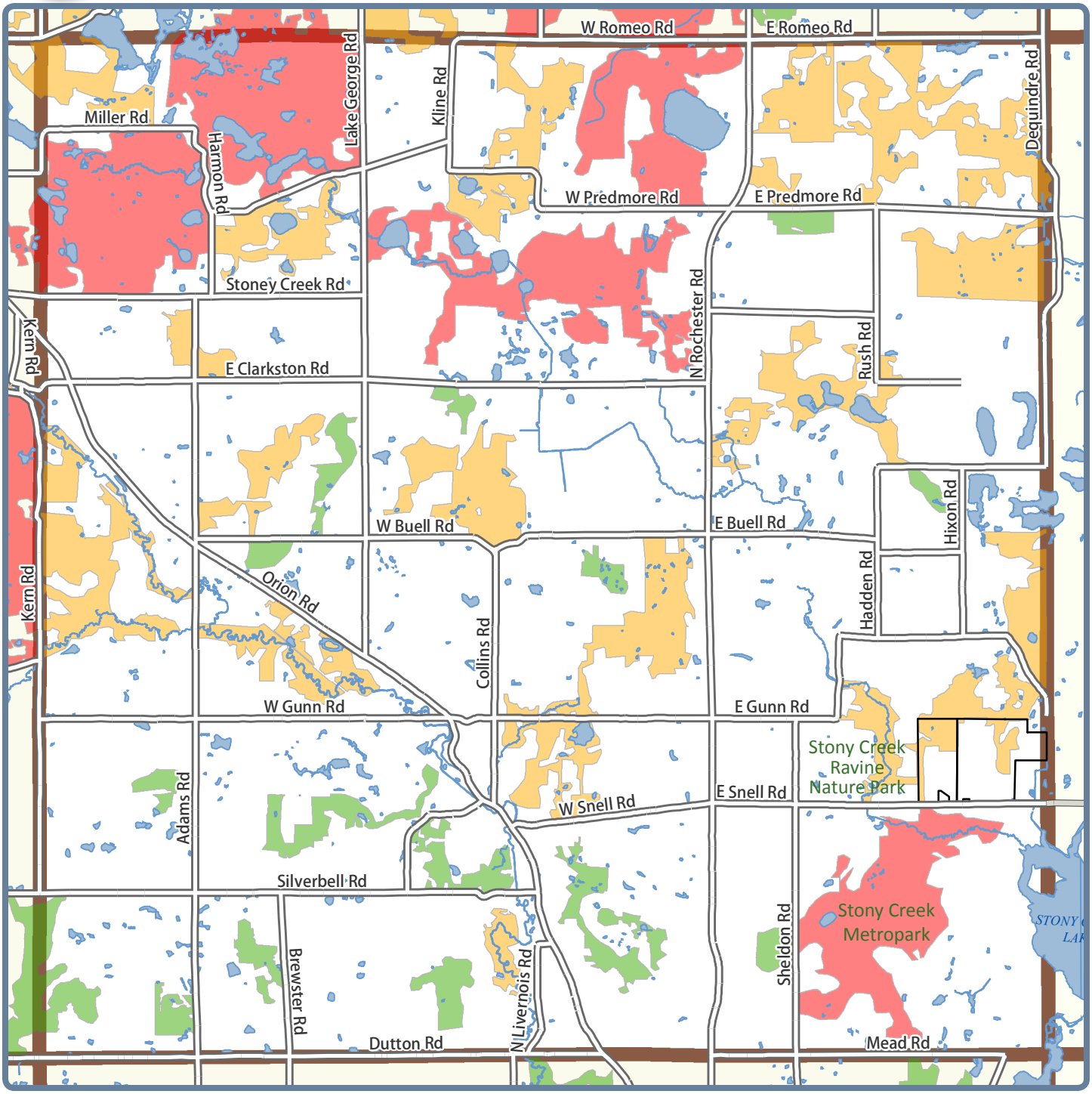
Stony Creek Ravine Nature Park Expansion

• 2015 Natural Resources Trust Fund Grant • Michigan Department of Natural Resources •

Map provided by: Oakland County Michigan, Economic Development & Community Affairs

2004 MNFI Natural Areas

TF15-0130



Road
Municipal Boundary
Lake or River
Area of Interest

Priority One
Priority Two
Priority Three

Distance in Miles
0 1 2

Proposed park is located near:
1395 E Snell Rd, Rochester, MI 48306
42°44'02.9"N 83°06'36.0"W

Oakland Township

Stony Creek Ravine Nature Park Expansion

• 2015 Natural Resources Trust Fund Grant • Michigan Department of Natural Resources •

Map provided by: Oakland County Michigan, Economic Development & Community Affairs