Rare Plant Species Surveys for the Michigan Department of Transportation: M–37 Kraft Ave to 92nd St, Kent County. MDOT Project No. 210063



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Cover: Clockwise from top left: Pale touch-me-not (*Impatiens pallida*); Goldie's woodfern (*Dryopteris goldiana*); Representative photo of southern mesic forest present along M-37.

All photos in this report, unless otherwise stated in captions, were taken by Danielle Smith.

Table of Contents

Abstract	1
Introduction and Methods	1
Results	2
Description of Segments	2
Segments 1, 4, 5, and 6	4
Segments 2 and 3	6
Discussion	10
References	10
Acknowledgements	10

List of Tables

Table 1. Previously documented occurrences of rare plant species within two miles of the	
project area	2
Table 2. Weedy plant species frequently encountered along dry, mowed roadsides	. 3
Table 3. Invasive plant species found within the project area	. 4

List of Figures

Figure 1.	The project area outlined in yellow and survey segments marked in red	1
Figure 2.	Photos of unsuitable habitat types in Segments 1, 4, 5, and 6: a) Typical roadside vegetation (Table 2), b) Disturbed hardwood forest and weedy opening, c) Commercial development, and d) Agricultural development	5
Figure 3.	Cat-tail patches found in: a) Segment 4, and b) Segment 6	6
Figure 4.	Map of Segments 2 and 3.	6
Figure 5.	Photos of Segments 2 and 3: a) Mesic southern forest located on the east side of M-37, b) Heavily eroded stream located on the east side of M-37, c) Mesic southern forest with wild ginger on the south side of 76 th St. SE, and d) Mesic southern forest with pawpaw on the north side of 76 th St. SE.	7
Figure 6.	Vegetation characteristic of the mesic southern forest in Segments 2 and 3: a) Doll's eyes, b) Blue cohosh, c) Canada waterleaf, and d) Horse-balm	8

Figure 7.	Culverts located in regions of higher quality mesic southern forest: a) Culvert 1	
	opening on the south side of 76 th St. SE, b) Culvert 1 opening on the north side	
	of 76 th St. SE, c) Culvert 2 opening on the east side of M-37, and d) Culvert 2	
	opening on the west side of M-37	9
Figure 8.	Aggressive invasive species found in discrete populations within Segment 3: a)	~
	Japanese knotweed, and b) Tree-or-neaven.	9

Abstract

The corridor for MDOT Project 210063 was surveyed for rare plant species during the late summer and early autumn of 2022. The purpose of these surveys was to determine if rare plants and their suitable habitat were present within the project area and assess the potential impact of planned road work. The project area consisted of approximately five miles of M-37 and two miles of intersecting roads. The entire corridor was surveyed by vehicle to identify suitable habitat for target species. High-quality southern mesic forest was documented near Lepard Preserve and in pockets nearby; however, no rare species were found. Disturbance to the two culverts within these high-quality areas should be minimized to avoid impacts to the associated forest. The entire corridor has many aggressive invasive species, and every effort should be made to avoid facilitating their spread into the mesic southern forest during road work; it is one of very few high-quality natural areas in the region.

Introduction and Methods

Rare plant surveys were required for project #210063 to ensure MDOT compliance with state and federal regulations. The project area is in Kent County and consists of approximately five miles of MDOT right-of-way along M-37 running from Kraft Ave at the northern end of the site to 92nd St at the southern end (Fig. 1). Roughly two miles of intersecting roads 76th ST SE and 84th St SE were also included in this project area.



Figure 1. The project area outlined in yellow and survey segments marked in red.

A search of the Michigan Natural Heritage Database was conducted to identify rare species that have been previously documented within a two-mile buffer of the project area, and several additional species were provided by MDOT (Table 1). Six of these occur in floodplain forest, dry-mesic southern forest, southern hardwood swamp, or mesic southern forest. The other two are typically found within prairie or barrens habitat, neither of which were present within the project area (MNFI 2022).

These habitats were the primary targets for survey efforts, however any suitable habitat for rare species was surveyed in case other species are present but not yet detected. The project area was initially assessed utilizing aerial imagery interpretation and vehicle surveys. Suitable habitat was then surveyed on foot. Rare plant occurrences were recorded using Survey 123 for upload into the Michigan Natural Heritage Database. Isolated, high-impact invasive species were documented using the Midwest Invasive Species Information Network (MISIN) phone app (MISIN 2022). General vegetation, potential natural community element occurrences, and other notable features were also recorded.

Table 1. Previously **d**ocumented occurrences of rare plant species within two miles of the project area.

Latin name	Common name	State status*	Target season ³			
Endodeca serpentaria	Virginia snakeroot	Т	mid – late summer			
Hybanthus concolor	green violet	SC	late spring – mid summer			
Hydrastis canadensis	goldenseal	Т	mid spring – early autumn			
Lithospermum latifolium	broad-leaved puccoon	SC	late spring – mid summer			
Morus rubra	red mulberry	Т	mid spring – early autumn			
Panax quinquefolius	ginseng	Т	early summer – mid autumn			
Platanthera ciliaris	orange-fringed orchid	Е	mid – late summer			
Ranunculus rhomboideus	prairie buttercup	Т	mid – late spring			
*T = state threatened; SC = state special concern; E = state endangered; X = state extirpated						

Surveys were conducted when species were most easily detected, typically during flowering or fruiting periods. Two surveys were conducted during the 2022 growing season – one during the mid-season and one during the late-season. The mid-season survey was conducted on July 25th and the late-season survey on September 6th. The site was revisited on November 14th to take more representative photos and capture additional invasive species populations.

Results

Description of Segments

The project area was divided into six segments for reporting as shown in Figure 1. Most of the project area consists of residential, commercial, and urban development, with open stretches of weedy grasses and forbs directly adjacent to M-37 (Table 2), and intersecting roads that are typically maintained by mowing. These areas lack suitable habitat for rare species and were not surveyed on foot. Some of the more dominant weedy species include tall goldenrod (*Solidago altissima*), smooth brome (*Bromus inermis*) Kentucky bluegrass (*Poa pratensis*), and tall fescue (*Lolium arundinaceum*).

Numerous aggressive invasive species are present throughout the entire project area, and these are listed in Table 3.

Table 2. Weed	y plant	species fre	quentl	y encountered	d along dr	y, mowed r	oadsides.

Latin name	Common name	Origin	Habit
Achillea millefolium	yarrow	native	forb
Agrostis gigantea	redtop	non-native	grass
Ambrosia artemisiifolia	common ragweed	native	forb
Asclepias syriaca	common milkweed	native	forb
Bromus inermis	smooth brome	non-native	grass
Centaurea stoebe	spotted knapweed	non-native	forb
Cichorium intybus	chicory	non-native	forb
Cirsium arvense	Canada thistle	non-native	forb
Dactylis glomerata	orchard grass	non-native	grass
Daucus carota	Queen Anne's lace	non-native	forb
Dipsacus fullonum	wild teasel	non-native	forb
Elymus repens	quack grass	non-native	grass
Erechtites hieraciifolius	fireweed	native	forb
Erigeron philadelphicus	common fleabane	native	forb
Hypericum perforatum	St. John's wort	non-native	forb
Leucanthemum vulgare	ox-eye daisy	non-native	forb
Lolium arundinaceum	tall fescue	non-native	grass
Medicago lupulina	black medic	non-native	forb
Melilotus albus	white sweet-clover	non-native	forb
Phleum pratense	Timothy	non-native	grass
Parthenocissus quinquefolia	Virginia creeper	native	vine
Plantago lanceolata	narrow-leaved plantain	non-native	forb
Plantago major	common plantain	non-native	forb
Poa pratensis	Kentucky bluegrass	non-native	grass
Setaria sp.	foxtail	non-native	grass
Solanum carolinense	horse-nettle	non-native	forb
Solidago altissima	tall goldenrod	native	forb
Torilis japonica	hedge-parsley	non-native	forb
Toxicodendron radicans	poison-ivy	native	vine
Tragopogon dubius	goat's beard	non-native	forb
Trifolium pratense	red clover	non-native	forb
Trifolium repens	white clover	non-native	forb
Verbascum thapsus	mullein	non-native	forb
Vitis riparia	river-bank grape	native	vine

Table 3. Invasive plant species found within the project area.				
Latin name	Common name	Habit		
Ailanthus altissima	tree-of-heaven	tree		
Alliaria petiolata	garlic mustard	forb		
Arctium minus	burdock	forb		
Berberis thunbergii	Japanese barberry	shrub		
Centaurea stoebe	spotted knapweed	forb		
Cirsium arvense	Canada thistle	forb		
Cirsium vulgare	bull thistle	forb		
Dipsacus fullonum	wild teasel	forb		
Elaeagnus umbellata	autumn olive	shrub		
Fallopia japonica	Japanese knotweed	forb		
Frangula alnus	glossy buckthorn	shrub		
Hedera helix	English ivy	vine		
Lonicera morrowii	morrow's honeysuckle	shrub		
Lotus corniculatus	birdfoot trefoil	forb		
Lythrum salicaria	purple loosestrife	forb		
Melilotus albus	white sweet-clover	forb		
Phalaris arundinacea	reed canary grass	grass		
Rhamnus cathartica	common buckthorn	tree		
Robinia pseudoacacia	black locust	tree		
Rosa multiflora	multiflora rose	shrub		
Solanum dulcamara	bittersweet nightshade	vine		
Torilis japonica	hedge-parsley	forb		
Typha ×glauca	hybrid cattail	forb		
Verbascum thapsus	mullein	forb		
Vinca minor	periwinkle	shrub		

Segments 1, 4, 5, and 6

Segment 1 and Segments 4-6 are all fairly similar in composition. They are fairly developed with inclusions of disturbed or depauperate hardwood forest and many areas dominated by weedy and invasive species (Fig. 2).

Disturbed and depauperate hardwood forests are mostly found in the southern portion of Segment 1 and scattered along Segments 4 and 5. These forests variy in topography and composition, but are generally dominated by sugar maple (*Acer saccharum*), green ash (*Fraxinus pensylvanica*), black walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*), gray dogwood (*Cornus foemina*), Virginia creeper (*Parthenocissus quinquefolia*), river-bank grape (*Vitis riparia*), Morrow's honeysuckle (*Lonicera morrowii*), tall goldenrod, heal all (*Prunella vulgaris*), Canada thistle (*Cirsium arvense*), and reed canary grass (*Phalaris arundinacea*).



Figure 2. Photos of unsuitable habitat types in Segments 1, 4, 5, and 6: a) Typical roadside vegetation (Table 2), b) Disturbed hardwood forest and weedy opening, c) Commercial development, and d) Agricultural development.

Other invasive species found in the upland habitats of these segments include, teasel (*Dipsacus fullonum*), burdock (*Arctium minus*), bittersweet nightshade (*Solanum dulcamara*), and multiflora rose (*Rosa multiflora*). Species commonly found in roadside marshes, ditches, swales, and other wet pockets include reed canary grass, purple loosestrife (*Lythrum salicaria*), and hybrid catt-tail (*Typha* ×*glauca*) (Fig. 4).

Small areas of potentially suitable habitat identified during the initial vehicle survey in these disturbed forests were surveyed on foot; however, no suitable habitat and no rare species were found in these segments.



Figure 3. Cat-tail patches found in a) Segment 4, and b) Segment 6.

Segments 2 and 3

The highest quality habitat within the project area was found in Segments 2 and 3 on the east side of M-37 and along the eastern section of 76th St. SE (Fig. 4). A high-quality mesic southern forest within Kent County Parks' Lepard Nature Reserve, extends to the north side of 76th St. SE and intermittent portions of the west side of M-37. These latter areas are lower in quality and less diverse.



Figure 4. Map of Segments 2 and 3.

The mesic southern forest found in these segments has varying topography including steep slopes angling toward the road, rolling undulations, and ravines created by culverts and other drainage features (Fig. 5). The consistently dense canopy is dominated by sugar maple, bitternut hickory *(Carya cordiformis),* American elm (*Ulmus americana*), and black walnut.

Shrubs are relatively sparse in the understory, but the most frequently occurring species include prickly gooseberry (*Ribes cynosbati*), green ash, gray dogwood, alternate-leaved dogwood (*Cornus alternifolia*), and spicebush (*Lindera benzoin*). Herbaceous and vine species vary by topography, but include Virginia creeper, running strawberry bush (*Euonymus obovatus*), poison ivy (*Toxicodendron radicans*), wild ginger (*Asarum canadense*), and many *sedges* (*Carex plantaginea, C. pensylvanica, C. gracillima, C. sprengelii, C. rosea, C. leptonervia*).



Figure 5. Photos of Segments 2 and 3: a) Mesic southern forest located on the east side of M-37, b) Heavily eroded stream located on the east side of M-37, c) Mesic southern forest with wild ginger on the south side of 76th St. SE, and d) Mesic southern forest with pawpaw on the north side of 76th St. SE.

Other characteristic and high-quality species include doll's eyes (*Actaea pachypoda*), wild onion (*Allium tricoccum*), pawpaw (*Asimina triloba*), blue cohosh (*Caulophyllum thalictroides*), horsebalm (*Collinsonia canadensis*), Canada waterleaf *Hydrophyllum canadense*), pale touch-me-not (*Impatiens pallida*), Christmas fern (*Polystichum acrostichoides*), and Goldie's woodfern (*Dryopteris goldiana*) (Fig. 6).



Figure 6. Vegetation characteristic of the mesic southern forest in Segments 2 and 3: a) Doll's eyes, b) Blue cohosh, c) Canada waterleaf, and d) Horse-balm.

There were two sets of culverts noted during surveys due to their presence within higher quality sections of southern mesic forest. Culvert 1 runs north to south underneath 76th St SE, and Culvert 2 runs east to west underneath M-37 (Fig. 7). Any changes to these structures during road work could impact the hydrology of the area and alter the quality of associated plant communities.

The upland invasive species found here are the same as those found in Segments 1, 4, 5, and 6; however, two additional species found in Segments 2 and 3 are worthy of note. These include Japanese knotweed (*Fallopia japonica*) and tree-of-heaven (*Ailanthus altissima*), both of which are high-impact invasive species that spread aggressively (Fig. 8). Shapefiles for these infestations have been provided to MDOT. Other invasive species found in Segments 2 and 3 include Morrow's honeysuckle, Japanese barberry (*Berberis thunbergii*), English ivy (*Hedera helix*), garlic mustard (*Alliaria petiolata*), periwinkle (*Vinca minor*), autumn olive (*Elaeagnus umbellata*). Because they are more widespread, they were not mapped specifically.



Figure 7. Culverts located in regions of higher quality mesic southern forest: a) Culvert 1 opening on the south side of 76th St. SE, b) Culvert 1 opening on the north side of 76th St. SE, c) Culvert 2 opening on the east side of M-37, and d) Culvert 2 opening on the west side of M-37.



Figure 8. Aggressive invasive species found in small, discrete populations within Segment 3: a) Japanese knotweed, and b) Tree-of-heaven.

Discussion

Every effort should be taken to maintain the integrity of the high quality mesic southern forest habitat located within and adjacent to Lepard Preserve in Segments 2 and 3. While no rare species were found there during the 2022 surveys, this area provides quality habitat and could serve as a refugia either for natural spread or transplants in the future. Areas like this are rapidly vanishing across the landscape of Lower Michigan (Cohen 2004).

Any potential alterations to two major culverts located within these high-quality areas should be avoided or minimized as much as possible to avoid disrupting the hydrology and quality of the plant communities present.

Two invasive species are of immediate concern in Segments 2 and 3: tree-of-heaven and Japanese knotweed. These aggressive spreaders are currently contained within small, discrete areas and it is recommended that they be treated before construction begins. Multiflora rose, Morrow's honeysuckle, and garlic mustard are more widespread in these two segments but could be treated with the assistance of adjacent landowners. Regular decontamination procedures should be followed during construction to minimize further spread of these species.

References

Cohen, J.G. 2004. Natural community abstract for mesic southern forest. Michigan Natural Features Inventory, Lansing, MI. 13 pp. https://mnfi.anr.msu.edu/communities/description/10684/mesic-southern-forest

Michigan Flora Online. 2022. https://michiganflora.net/home.aspx [Accessed November 2022.]

MNFI. 2022a. Michigan Natural Features Inventory Website <u>https://mnfi.anr.msu.edu/</u> [Accessed November 2022.]

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