Rare Plant Surveys for the Michigan Department of Transportation: M-14 Sheldon Rd. to Newburgh Rd. Wayne County, Michigan. MDOT Project #208481

Prepared By:

Phyllis J. Higman
Michigan Natural Features Inventory
Michigan State University Extension
P.O. Box 13036
Lansing, MI 48901

Prepared For:

Michigan Department of Transportation

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Cover photo: M-14 looking southwest from Northville Rd. in Wayne County, Michigan.

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Abstract

This project area has mostly steep maintained slopes that rise from the highway to trees and shrubs at the fence line. The slopes are dominated by weedy grasses and forbs with occasional scattered and clumped woody plants and there are frequent wet ditches that have established infestations of invasive phragmites and cat-tails. The maintained medians and interchange loops are similar, but with undulating topography. West of Sheldon Rd. and along the southern portions of the I-275 interchanges have steep slopes downward, but similar weedy species. The mesic forest west of Northville Rd. contributes to a regional greenbelt along the Middle River Rouge, and a prairie planting with state threatened compass plant and rosin weed occurs in the northwest quadrant of the I-275 interchange. However, no suitable habitat for rare species was found within the survey zone and no rare species were documented. An isolated infestation of Japanese knotweed at Robinwood Dr. and M-14 is recommended for immediate treatment. Disturbance to the mesic forest and the prairie planting should be avoided and best practices implemented to minimize the spread of invasive species.

Introduction

This report provides a summary of rare plant surveys along the I-75 right-of-way (ROW) and interchanges from Sheldon Rd. to Newburgh Rd. in Wayne County(Fig. 1). These surveys are required to ensure regulatory compliance for threatened and endangered species that might be impacted by proposed reconstruction work along the corridor for MDOT Project #208481.

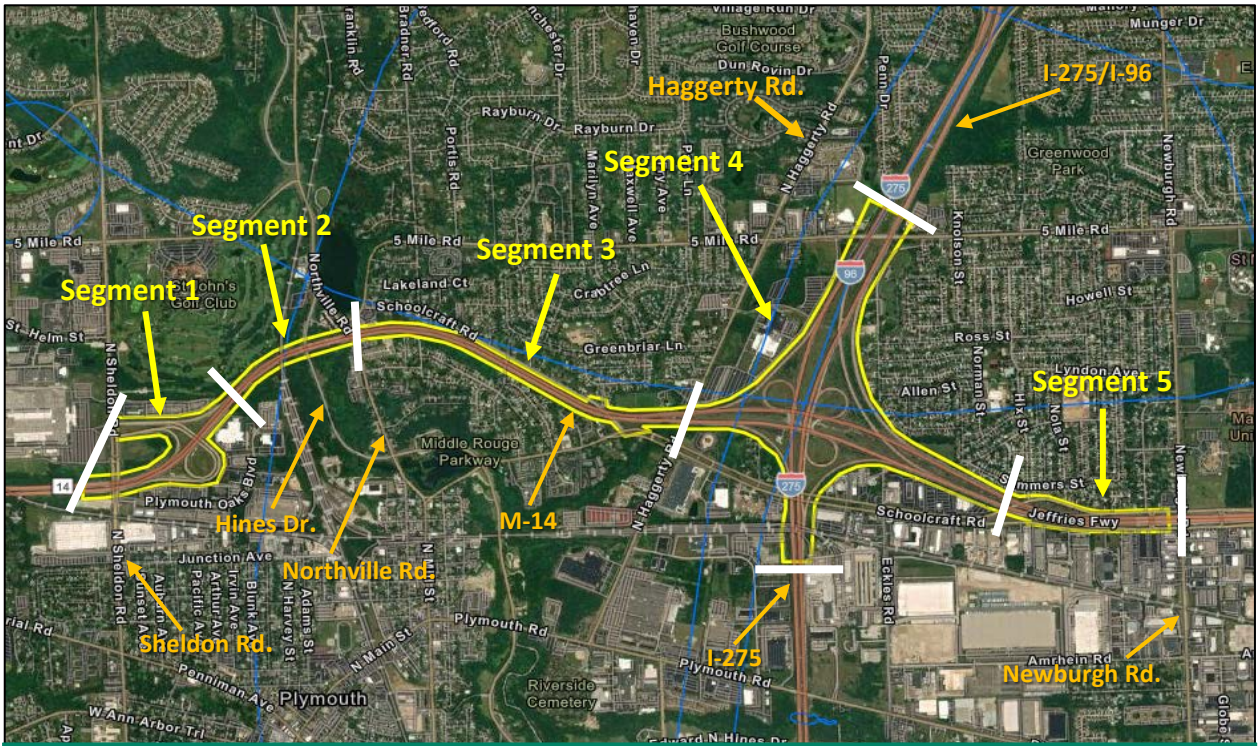

Figure 1. Project location with survey corridor shown in yellow, road names in orange, and survey segments separated by the white lines and labeled in yellow.

Methods

A review of the Michigan Natural Heritage database was conducted for natural communities, federal or state listed species, and state special concern species[1] that have been previously documented within a two-mile radius of the project area. Six species were identified from the database as target species for this project and two additional species were added to the list based on observations from previous scoping of the area by MDOT (Table 1). These eight species guided the survey effort, however, any suitable habitat for rare plants was surveyed in case other species might occur in the project area that have not yet been documented.

Table 1. Survey targets, their status, and optimal survey times.

Scientific Name	Common Name	Listing Status[1]	Optimal Survey Period
Adlumia fungosa	*climbing fumitory*	SC	June - September
Galearis spectabilis	*showy orchis*	T	May – June
Hybanthus concolor	green-violet	SC	mid-May - July
Jeffersonia diphylla	twin flower	T	mid-April – early May
Prosartes maculata	nodding mandarin	X	late April – May
Pycnanthemum verticillatum	whorled mountain mint	SC	August – September
Silphium laciniatum	compass plant	T	July - August
Silphium perfoliatum	cup plant	T	July - October

[1]T: state threatened; X: presumed state extirpated; SC: state special concern

Aerial imagery of the project area was reviewed to identify areas that clearly lack suitable habitat (commercial, residential, developed, mowed, maintained, or cropped areas) and areas with potentially suitable habitat for target species. Aerial maps with the project location and the previously documented rare species were georeferenced and loaded onto a Samsung tablet with a Field Maps application. This enabled surveyors to view their location, suitable habitat, and previously documented occurrences of rare plants while in the field.

The entire project corridor was surveyed by vehicle to confirm areas with potentially suitable habitat for rare species. Brief surveys were conducted at representative areas with unsuitable habitat to confirm unsuitability and to capture the species composition. Detailed, on-foot meander surveys were then conducted in areas with potentially suitable habitat.

Surveys were timed to coincide as much as possible with the flowering or fruiting periods of the target species when they are most easily detected. Because this project was provided to us after the ideal early and mid-season surveys, only late season surveys were conducted in 2022. Visits occurred on September 7, 10, 11, and 17.

[1] State and federal threatened and endangered status are codified under Part 365 of PA 451, 1994 Michigan Natural Resources and Environmental Protection Act. State special concern and presumed extirpated status are NatureServe designations for species that appear to be declining, and those that are presumed extirpated based on extensive searching of historical sites.

Populations of rare plant species and isolated, high impact invasive species were documented throughout the project area. Rare plant occurrences were mapped with a Samsung tablet using Survey 123, to capture GPS points and associated data. Shapefiles were delivered to MDOT after each survey period and these data were later entered into the Michigan Natural Heritage Database. Isolated, high-impact invasive species that did not occur commonly throughout the project area were mapped using the Midwest Invasive Species Information Network (MISIN) phone app (MISIN 2022). Shapefiles for these data were provided to MDOT after each survey period. Surveyors also noted general habitat conditions, dominant plant species, and any other noteworthy observations.

The survey area was divided into segments for reporting, as shown by the white lines and yellow labels in Figure 1. The vegetation for each segment is described in the results section along with representative photos.

Results

Segment 1: Interchanges at Sheldon Rd.

Figure 2. Segment 1: Sheldon Rd. interchanges. Stars denote photo locations and figure numbers.

The right-of-way and interchange triangles and circles at Sheldon Road are maintained and mowed, except in low, wet spots and on the steepest slopes. They are dominated by weedy grasses and forbs in the open areas, with scattered or occasional clumps of woody trees and shrubs.

On the north side, there is a steep slope from the fenceline at the ridge down to the highway. Portions of this slope are dominated by gray dogwood (*Cornus foemina*), white mulberry (*Morus rubra*), and abundant invasive Oriental bittersweet (*Celastrus scandens*), common buckthorn (*Rhamnus cathartica*), and multiflora rose (*Rosa multiflora*) (Fig. 3). In other areas the slopes are dominated by Eurasian grasses and weedy forbs, as are the interchange circles and triangles (Fig 4).

Common grasses include foxtails (*Setaria* spp.), fescues (*Festuca* spp.), smooth brome (*Bromus inermis*), red top (*Agrostis gigantea*), and bluegrasses (*Poa pratensis*, *P. compressa*). Common forbs include goldenrods (*Solidago canadensis*, *S. altissima*), asters (*Symphyotrichum pilosum, S. ericoides*), black-eyed susan (*Rudbeckia hirta*), common milkweed (*Asclepias*

syriaca), Indian hemp (*Apocynum cannabi-num*), mugwort (*Artemisia vulgaris*), wild carrot (*Daucus carota*), common ragweed (*Ambrosia artemisiifolia*), garden tansy (*Tanacetum vulgare*), dock (*Rumex* sp.), teasel (*Dipsacus fullonum*), chickory (*Cichorum intybus*), sweet clover (*Melilotis* sp.), spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), butter and eggs (*Linaria vulgaris*), and narrow-leaved plantain (*Plantgo lanceaolata*).

Figure 3. North side of M-14 off-ramp to Sheldon Rd, looking east with the Hilton Garden Inn Plymouth at the top of the ridge.

The scattered or clustered trees and shrubs are predominantly walnut, box elder (*Acer negundo*), Russian-olive (*Elaeagnus angustifolia*), Norway maple (Acer platanoides), black locust (*Robinia pseudoacacia*), black pine (*Pinus nigra*), staghorn sumac (*Rhus typhina*), common buckthorn, autumn olive (*Elaeagnus umbellata*), Callery pear (*Pyrus calleryana*), and Siberian crab (*Malus baccata*),

Wetter zones in depressions and ditches are occupied by cottonwood (*Populus deltoides*), Russian olive (*Elaeagnus angustifolia*), trembling aspen (*Populus tremuloides*), glossy buckthorn (*Frangula alnus*), narrow-leaved cat-tail (*Typha angustifolia*), hybrid cat-tail (T. ×glauca), grass-leaved goldenrod (*Euthamia graminifolia),* non-native phragmites (*Phragmites australis*), and reed canary grass (*Phalaris arundinacea)* (*Figs. 5, 6*).

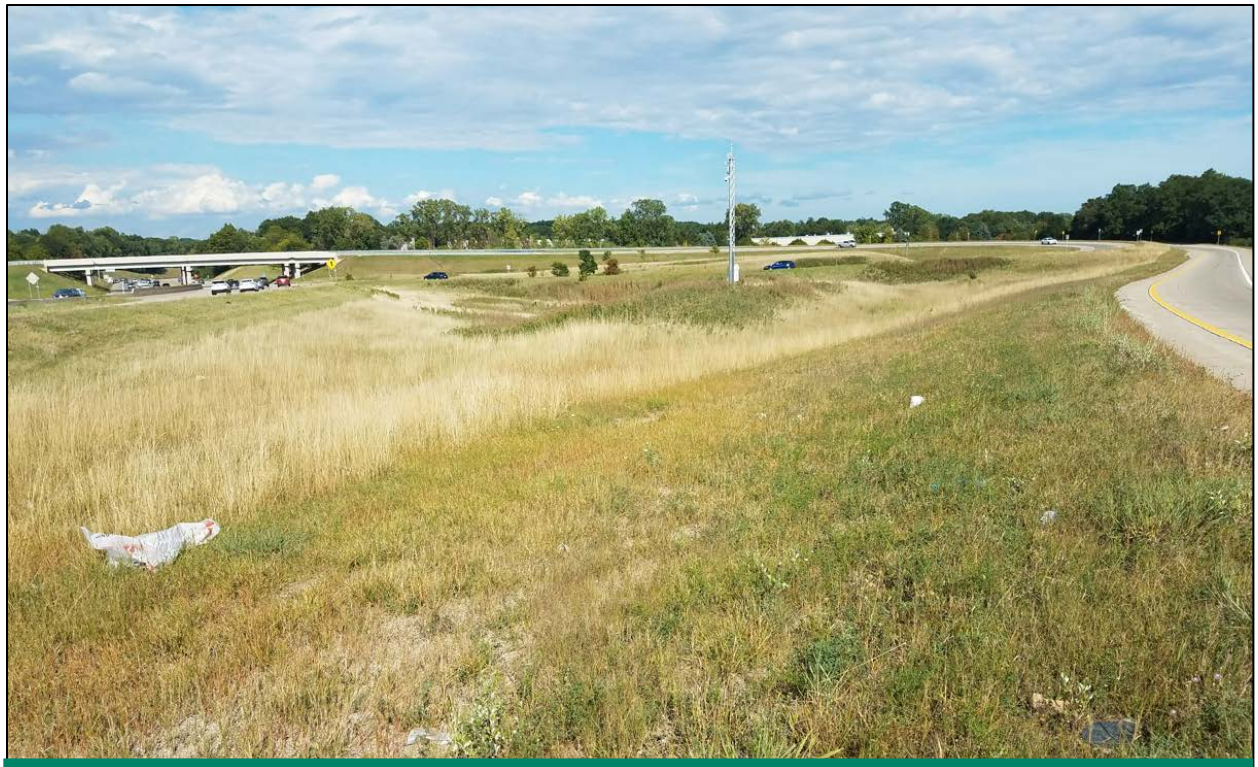

Figure 4. Interchange at Sheldon Rd. looking east, with a few scattered trees and shrubs.

Figure 5. Interchange at Sheldon Rd. with non-native phragmites in a depression.

Figure 6. Wetland with **c**ottonwood, common buckthorn, and non-native phragmites bordering the right-of-way in the center of the Sheldon Rd. interchange.

On the south side of the interchange along M-14, there is a narrow, mowed zone that merges to a steep, densely vegetated slope downward with cottonwood, box elder, staghorn sumac, gray dogwood, Amur honeysuckle (*Lonicera maackii*), common buckthorn, river-bank grape, thicket creeper, and teasel. (Figs. 7, 8).

Figure 7. Steep downward slopes south of M-14, looking west from Sheldon Rd.

Figure 8. Steep downward slopes south of M-14, looking east from Sheldon Rd.

At the east end of the interchange as M-14 approaches Segment 2, there are open, maintained slopes up to a wooded border at the fence line along the ridge (Fig. 9). No suitable habitat was observed in this segment and no rare species were ffound.

Figure 9. M-14 looking northeast from Segment 1 to Segment 2.

Figure 10. Segment 2: Wooded zone west of Northville Rd. Stars denote photo locations and figure numbers.

Segment 2: Wooded zone between Segment 1 and Northville Rd.

This segment extends east from the Sheldon Rd. interchages to Northville Rd. and is bisected by a set of railroad tracks and Edward N. Hines Drive, that run perpendicular to M-14 and parallel to Northville Road (Fig. 10).

The northwest portion of this segment has a narrow fringe of woody species bordering a golf course to the north and an open maintained slope down to the highway (Fig. 10). Canopy trees barely reach over into the right-of-way and include sugar maple (*Acer*

saccharum), white ash (*Fraxinus americana*), red oak (*Quercus rubra*), basswood (*Tilia americana*), and cottonwood. The understory is weedy with common buckthorn, Amur honeysuckle, common privet (*Ligustrum vulgare*), Oriental bittersweet, thicket creeper, and poison ivy. The ground flora in the wooded edge is almost exclusively non-native species and merges quickly into the maintained, open slopes with weedy forbs and grasses similar to those that occur in Segment 1.

A mesic northern forest spans most of the remainder of this segment on both the north and south sides of M-14, and the Middle River Rouge meanders through it northward to Phoenix Lake (Figs. 10, 11). The canopy is dominated by sugar maple, American beech (*Fagus grandifolia*), white ash, red oak, with occasional white and black oak. Near the river, sycamore (*Acer platanoides*), pin oak (*Quercus palustris*), cottonwood, American elm (*Ulmus americana*), and box elder are more common.

Figure 11. Looking west from Northville Rd. on the north side of M-14, Segment 2.

Although it is fragmented by the tracks and the road, this is the only significant block of forest within reach of the entire project corridor. In the heart of the mesic forest between Edward N. Hines Dr. and the railroad tracks, sugar maple and beech with dbh > 18”were observed, with black cherry (*Prunus serotina*) and ironwood (*Carpinus caroliniana*) in the understory and a rich ground flora, including species like sharp-leaved hapatica (*Hepatica acutiloba*) and long-

stemmed sedge (*Carex pedunculata*). The topography is undulating with steep slopes down to streamlets that feed into the Middle Rouge River.

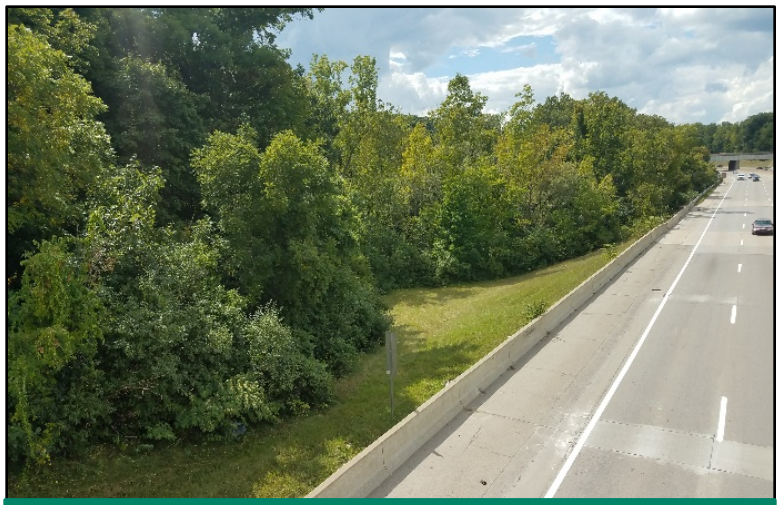

Figure 12. Looking east from Northville Rd. on the south side of M-14, Segment 2.

The rights-of-way directly adjacent to the M-14 are mowed and dominated by weedy grasses and forbs like those in Segment 1 (Fig. 12). Woody species extend into the mowed zone in some places, but there are only a few spots where any of the mesic forest canopy trees and associated species are rooted in the right-of-way. These areas were scoured for showy orchis (*Galearis spectablis*), twinleaf (Jeffersonia diphylla), green violet (*Hybanthus concolor*), and nodding mandarin (*Prosartes maculata*).

These edges are exposed to high light conditions and weedy species are well established in this zone, including box elder, black locust, Norway maple, white mulberry, river-bank grape, thicket creeper, common buckthorn, Amur honeysuckle, and Oriental bittersweet. The associated mesic forest ground flora is also lacking along the edges. Suitable habitat for rare species was not found in the right-of-way and none were found in this segment.

Segment 3: Northville Rd. to Haggerty Rd.

This segment is dominated by mowed slopes rising upward from the highway with the same characteristic weedy grasses and forbs and scattered trees that are found in other segments of the project area (Fig. 13).

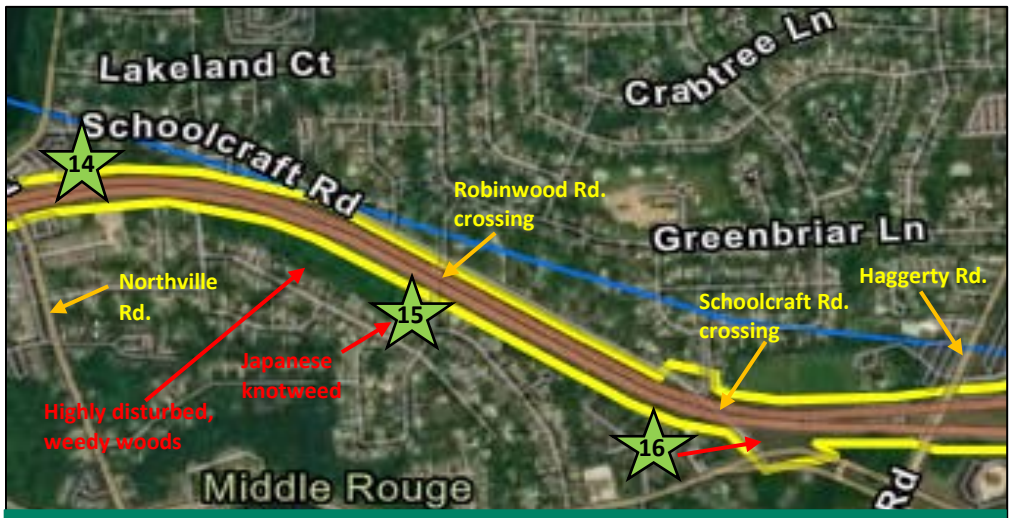

Figure 13. Segment 3: Northville Rd. to Haggerty Rd.

Natural habitat is sparse, and for the most part the right-of-way merges directly into businesses and housing to the north and south (Fig. 13). The most common species that breach the fence

line into the right-of-way include walnut, white mulberry, box elder, staghorn sumac, common buckthorn, thicket creeper, Amur honeysuckle, and Oriental bittersweet. There are occasional ironwood, white pine, Norway maple, spruce (*Picea sp.*), and red cedar (*Juniperus virginiana*). The rectangular wooded zone on the south side of M-14 west of Robinwood Dr. identified as potential habitat (Fig. 13) is dominated by these weedy species instead. A small, isolated patch of Japanese knotweed was mapped at M-14 and Robinwood Dr. (Figs. 13, 15).

Figure 14. Looking northeast from Northville Rd. from the south side of M-14, Segment 3.

Figure 15. Japanese knotweed at the southwest corner of Robinwood Dr. and M-14 in Segment 3.

Figure 16. Schoolcraft Rd. looking west as it merges into Wilcox Road. Segment 3.

The open areas at the Schoolcraft Rd. crossing on the south side of M-14 is mowed and has scattered shrubs and trees (Fig,16) including silver maple basswood, river-bank grape, and thicket creeper.

No suitable habitat for rare species occurs in this survey segment.

Segment 4: The M-14 and I-275 Interchanges

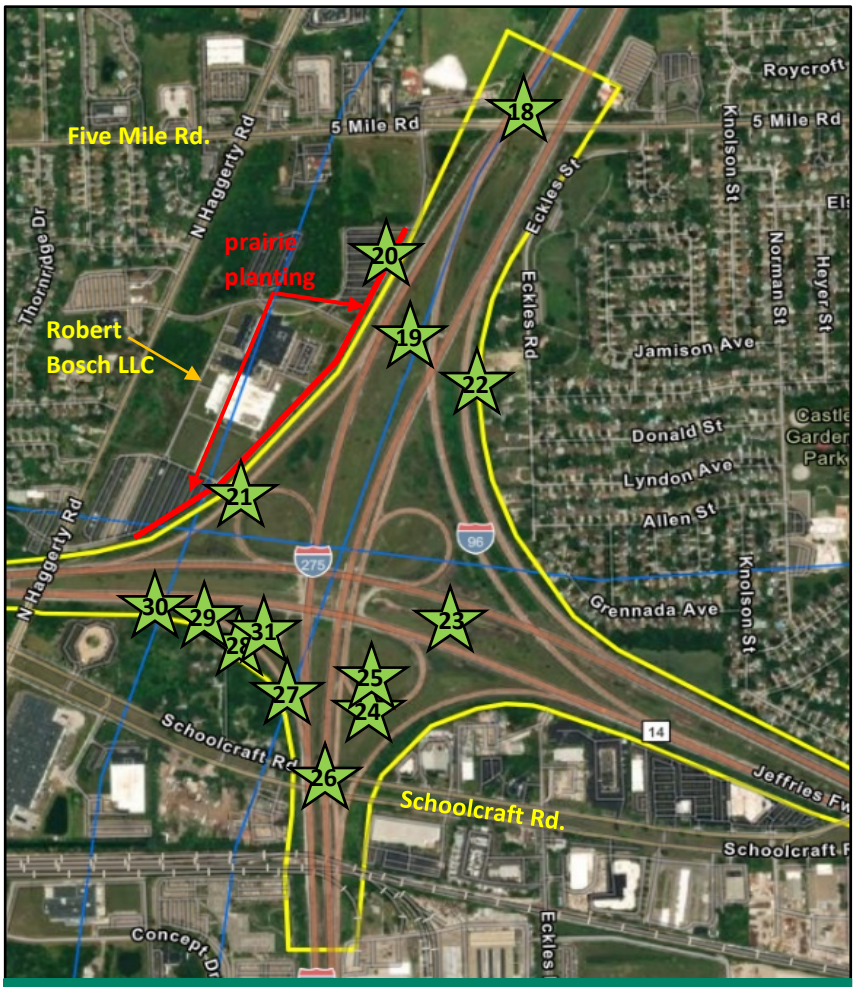

Figure 17. Segment 4: The M-14 and I-275 interchanges.

This segment is mostly open slopes that are maintained by mowing and dominated by weedy grasses and forbs and occasional trees or clumps of trees. There is typically a wooded border at the edges of the maintained zones and frequent low wet ditches directly adjacent to the highway that often have large infestations of non-native cat-tails and non-native phragmites.

The interchange circles and triangles are also dominated by weedy grasses and forbs with scattered trees and shrubs, and low wet zones with invasive cat-tails and phragmites.

Brief highlights in each of the four quadrants are provided below.

Northwest Quadrant

This quadrant has open, grass dominated slopes with trees and shrubs at the top of the ridge, and a wet ditch at the bottom (Fig. 18). There is a paved bike trail on the ridge that runs parallel to the highway all the way to Edward N. Hines Drive in Segment 2.

Common trees and shrubs are the same as those found in other segments.

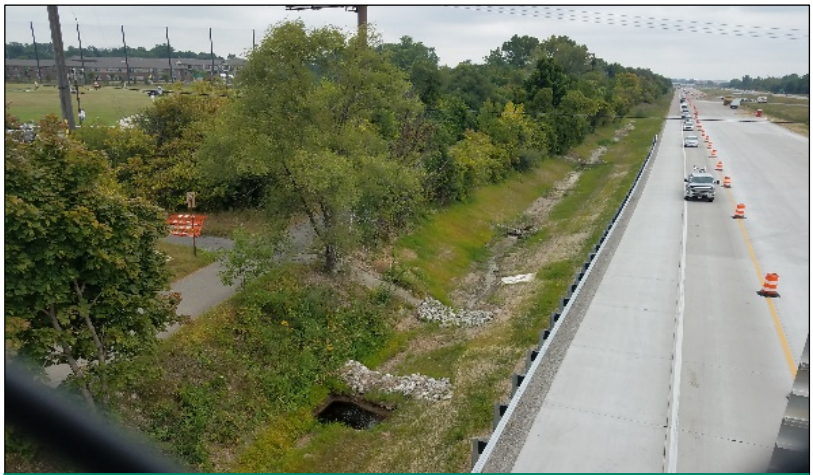

Figure 18. Looking north from Five Mile Rd. along south-bound I-275 in the northwest quadrant of Segment 4.

The median is similarly dominated by weedy grasses and forbs, with occasional clumps of shrubs and trees. The topography is undulating with wetland species in depressions (Fig. 19).

Figure 19. The median between north and south-bound I-275, north of M-14 in Segment 4.

There is a prairie planting along the entire east side of the Bosch Plant parking lot just outside of the right-of-way (Fig.17). State threatened compass plant (*Silphium laciniatum*) and rosin weed (*Silphium integrifolium*) were observed in the planting, as was the unlisted prairie dock (*Silphium terebinthinaceum*) and numerous additional prairie plants (Fig. 19). In spite of extensive searching, these were not observed in the right-of-way; however, several occurrences of big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), butterfly weed (*Asclepias tuberosa*), and New England aster (*Symphyotrichum novae-angliae*) were observed (Fig. 20).

Figure 20. State threatened compass plant and rosin weed, and non-listed prairie dock in a prairie planting just outside the right-of-way in Segment 4, northwest quadrant.

Figure 21. Indian grass and butterfly weed in the median where I-275 merges west to M-14, in the northwest quadrant of Segment 4.

Northeast Quadrant

Like other segments, this area has weedy grasses and forbs dominating the open slopes of the right-of-way, with woody species at the top of the slope (Fig. 22). In one location, aromatic sumac (*Rhus aromatica*) was found, but most of this area has wetter soils and cottonwood is especially common. The median, as shown in the previous segment (Fig. 19), has a similar weedy matrix, with scattered individual and clustered trees and shrubs. At the northern extent of this quadrant, the median between sloped steeply upward, but maintains the same weedy matrix with scattered woody plants.

The ditch immediately adjacent to the highway is significantly wider and wetter than in the north-west quadrant and is dominated by large infes-tations of phragmites, with some cat-tails and purple loosestrife (*Lythrum salicaria*). Torrey's rush (*Juncus torreyi*), cursed crowfoot (*Ranun-culus sceleratus*), and southern water-plantain (*Alisma subcordatum*) are also common.

Figure 22. Northbound I-275 in the northeast quadrant of Segment 4.

The median between east and west-bound M-14 at the east end of the segment has extensive depressions with even larger wet infestations of phragmites (Fig. 23). The trees and shrubs scattered here include sycamore (*Platanus occidentalis*), Quercus rubra, Russian olive, white mulberry, red cedar, staghorn sumac, Siberian crab, common buckthorn, and Amur honey-

suckle. Common forbs include horsetail *(Conyza canadensis*), chicory, mugwort, various asters and goldenrods, wild teasel, and Canada thistle.

Figure 23. Median between east and west-bound M-14 with large infestations of phragmites and non-native cat-tails, and scattered trees in the northwest quadrant of Segment 4.

Southeast Quadrant

Similar, scattered trees and shrubs occur amidst a sea of weedy grasses and forbs in the outer rights-of-way in this quadrant, although species with higher wetland coefficients are more common, such as cottonwood, willow (*Salix sp.*), pin oak, and sycamore. The interchange circles and triangles are dominated by Eurasian grasses with sparse occurrences of trees and shrubs (Fig. 24). Seaside goldenrod (*Solidago sempervirens*) and heath aster (*Symphyotrichum ericoides*) were prominent at the time of survey (Fig. 25).

Figure 24. Interchange area in the southeast quadrant of Segment 4 dominated by smooth brome, tall fescue, and sand dropseed.

Figure 25. Seaside goldenrod and heath aster are common in the southeast quadrant of Segment 4.

In the southern portion of this quadrant, there is a steep drop down from the highway that is heavily vegetated with grasses and forbs, and merges into a woody zone and typically a wet ditch. A similar suite of trees and shrubs that characterizes the entire corridor are found here as well: cottonwood, white ash, box elder, white mulberry, red cedar, Russian olive, Siberian crab, common buckthorn, staghorn sumac, and Amur honeysuckle (Fig. 26). Prominent forbs include wild teasel, burdock (*Arctium minus*), and sweet clover (*Melilotus* spp.) South of Schoolcraft Rd. the survey area is highly disturbed by railroad activities and business development.

Figure 26. Schoolcraft Rd. crossing under I-275 in the southeast quadrant of Segment 4 with steep vegetated slopes down to a wet zone with invasive phragmites.

Southwest Quadrant

This quadrant is similar to the southeast quadrant; generally wet and weedy. It is highly disturbed along I-275 to the south with railroad tracks and development, and steeply sloped downward from the highway (Fig. 27) all the way to Schoolcraft Rd. The slopes lessen as the highway curves westward, but a wet ditch zone infested by invasive phragmites remains (Fig. 30). In this area Indian-potato (*Apios americana*) was observed in full bloom (Fig. 31) and Amur honey-suckle was bearing its signature fruit (Fig. 32).

Figure 27. Steep slopes in the southwest quadrant of Segment 4.

Figure 28. Wet ditch with invasive phragmites where M-14 merges to I-275 south in the southwest quadrant of Segment 4.

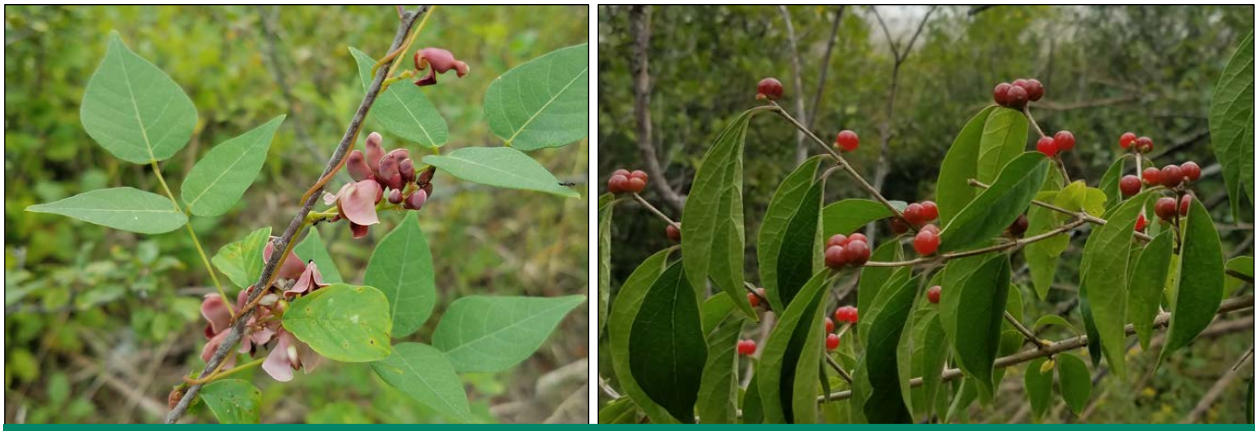

Figure 29. Indian potato (left) and Amur honeysuckle (right) observed in the southwest quadrant of Segment 4.

Further west towards Haggerty Rd. the slope transitions to uplands with scattered trees and shrubs that are maintained by mowing (Fig. 30). Like other segments, the medians are dominated by weedy grasses and forbs, a few scattered trees and shrubs, and depressions with invasive phragmites (Fig. 31).

Figure 30. Slopes rise up from the highway near the intersection of Haggerty Rd. and M-14 in the southwest quadrant of Segment 4.

Figure 31. Interchange triangle in the southwest quadrant with weedy grasses and forbs, a few shrubs, and wet depressions with invasive phragmites.

Segment 5: Schoolcraft Rd. to Newburgh Rd.

Figure 32. Segment 5: Schoolcraft Rd to Newburgh Rd.

This segment of the project area has steep, maintained slopes from the road edge to the fence line at the top of the ridge surrounded by housing and business (Fig. 32). It includes the on and off ramps to M-14 and adjacent Schoolcraft Rd. on both north and south sides and where it crosses the highway. Similar to the other segments, the vegetation is dominated by weedy grasses and forbs with clumps of woody species and occasional mature trees (Fig. 33, 34).

Figure 33. Steep maintained slopes with weedy grasses and forbs and occasional clumps of trees and shrubs in Segment 5.

Figure 34. M-14 East with weedy forbs and grasses and occasional trees and shrubs in Segment 5.

Common woody species include, cottonwood, white ash, hackberry, white mulberry, Norway maple, black pine, black locust, Siberian elm (*Ulmus pumila*), Tartarian honeysuckle (*Lonicera tatarica*), and the ubiquitous river-bank grape, thicket creeper, Amur honeysuckle, and common buckthorn. Hackberry (Fig. 35) and Siberian elm are noticeably more frequent in this segment than in other segments of this project area.

Forbs and grasses dominate the slopes, and include common milkweed, bush honeysuckle (*Diervilla lonicera*), late boneset (*Eupatorium serotinum;* Fig. 35), horseweed, wild carrot, mugwort, crown vetch, bouncing bet, butter and eggs, sow thistle (*Sonchus* sp.), spotted knapweed (*Centaurea stoebe*), fescues, foxtails, and smooth brome.

Figure 35. Hackberry (left) and late boneset (right) are common along M-14 in Segment 5.

The large opening in the north-west corner of this segment between Schoolcraft and M-14, is maintained by mowing, and has scattered trees such as silver maple, walnut, and Norway maple, black locust, and thorn-less honey locust (Fig. 36).

Like the other survey segments, no rare species were found in in Segment 5.

Figure 36. Mowed zone between M-14 and Schoolcraft Rd. in the northwest corner of Segment 5.

Discussion

The majority of this project corridor is dominated by open slopes with weedy and invasive grasses and forbs, with scattered trees and clumps of trees, shrubs, and vines, and a narrow wooded border at the fence line. Many of the woody species are weedy or invasive.

The only woodland area within reach of the project area that could support rich mesic forest species such as showy orchis, nodding mandarin, green violet, or twinflower, occurs west of Northville Road. This forest is part of a regional greenbelt surrounding the Middle River Rouge which flows under M-14. Where it intersects the project area at M-14, it is degraded by the spread of ubiquitous invasive species such as Amur honeysuckle, common buckthorn, and Oriental bittersweet, and edge effects that create high light conditions in the survey zone. These factors limit the potential for suitable habitat for these species in the right-of-way and no suitable habitat was found. While the forest is fragmented by Edward N. Hines Drive and railroad tracks, it is one of the largest forested areas along the river and it is recommended that disturbance in this area be avoided as much as possible to limit further degradation of the forest interior.

The predominance of open grass and forb dominated areas throughout the project area could result in pockets of both wet and dry prairie for species such as compass plant and rosin weed or other rare prairie species. However, these areas are degraded by multiple non-native and invasive species, as well as general disturbance from road work, precluding any quality habitat for these species. The prairie planting in the northwest quadrant of the M-14/I-275 interchange harbors occurrences of compass plant and rosin weed, but it is just outside of the survey zone. Disturbance in this area should also be limited to avoid degradation of the planting.

References

Michigan Legislature, 21994. Natural Resources and Environmental Protection Act 451 of 1994. Part 365 Endangered Species Protection. http://www.legislature.mi.gov/documents/mcl/pdf/mcl-451-1994-iii-1-endangered-species-365.pdf [Accessed 11/20/21]

Midwest Invasive Species Information Network. https://www.misin.msu.edu/apps/ [Accessed 11/30/11]

NatureServe. 2021. NatureServe Conservation Status Categories. https://explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories [Accessed 12/16/22]

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