Rare Plant Surveys for the Michigan Department of Transportation, I-275 Resurfacing and I-75 Bridge Replacements, Monroe County, Michigan.



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Cover: North I-275 signage and trailing bean at I-75 Nadeau Road Bridge. Photos by Brian Klatt.

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Abstract

Foot surveys for rare species were conducted in the un-mowed rights-of-way (ROW) of I-275 from its junction with I-75 north to Wil Carleton Drive in Monroe County, which is proposed for resurfacing. The surveys revealed that the ROW is dominated by old-field (early successional) plant communities, especially stands of mixed shrubs and non-native reed (*Phragmites* australis). None of the target rare species identified in connection with this project were found along the proposed I-275 re-surfacing route.

Surveys were also conducted in the areas of three bridge replacements associated with I-75 in Monroe County: the Nadeau Road bridge over I-75 and two bridges of I-75 crossing Swan Creek. None of target rare species were found at Swan Creek. However, trailing wild bean (*Strophostyles helvula*) was found adjacent to the west side of the north bound entrance ramp at the Nadeau Road interchange. Additionally, a potential bat roost tree was noted at the Nadeau Road/I-75 interchange and is in a position where impact from construction activities is likely.

Introduction

To assist the Michigan Department of Transportation (MDOT) in meeting state and Federal environmental review requirements, the Michigan Natural Features Inventory (MNFI) conducted field surveys for rare species and areas of high conservation value in three areas of proposed highway projects in Monroe County, Michigan. These areas included: 1) resurfacing of Interstate 275 (I-275) from its junction with Interstate 75 (I-75), north to Wil Carleton Road; 2) replacement of the overpass bridge at the intersection of I-75 and Nadeau Road; and 3) replacement of the two I-75 bridges over Swan Creek. The focus of the surveys was rare species known to occur in the area based on a search of the Natural Heritage Database (NHD) maintained by MNFI. The NHD is the most comprehensive database on the location and condition of threatened, endangered, and other rare species in the State of Michigan, as well as high-quality natural communities. This database has been compiled by professional biologists over the past 40 years under the Natural Heritage Methodology (NatureServe 2020) and is relied on by state and Federal regulators within Michigan, as well as by conservation organizations, businesses, and the public.

Methods

The areas surveyed included approximately 7.5 miles of I-275 from its junction with I-75 north to its intersection with Wil Carleton Road in Monroe County; the interchange area of I-75 and Nadeau Road; and the interchange and associated bridges of I-75 where it crosses Swan Creek. The project footprint of the I-275 re-surfacing, the Nadeau Road bridge replacement, and

the Swan Creek bridge replacement project areas are depicted in Figures 1, 2, & 3, respectively. Field searches consisted of meander surveys on foot along the un-mowed ROW on both sides of the highway, constituting approximately 15 miles of linear ROW. Additionally, the interchange loops and areas between ramps were also surveyed.



Target species were determined by a search of the NHD for known occurrences of species included on the State and Federal lists of threatened and endangered species. Though not protected legally, "Special Concern" species were also considered target species. Special Concern species are those, though not currently on the lists of threatened and endangered species, are designated by MNFI to be vulnerable and could become threatened or endangered, or for which insufficient information as to their abundance exists. The target species are listed in Tables 1 and 2.

The surveys were conducted from 23 - 31 July 2020, which includes the recommended survey periods as determined by MNFI abstracts (MNFI 2020) for most of the target species. Constraints due to the Covid-19 crisis, namely obtaining of waivers from the stay-at-home Executive Orders issued by the Governor of Michigan, prevented conducting surveys for those species whose optimal survey times were in May - June. However, those species have persistent parts

that can be observed for an extended time. These include Virginia spiderwort (*Tradescantia virginiana*), sedge (*Carex squarrosa*), and goldenseal (*Hydrastis canadensis*).



Figure 2. I-75 Nadeau Road bridge replacement project area.



Figure 3. I-75 Swan Creek bridge replacement project area.

Table 1. Target species for I-275 re-surfacing project area.					
Common Name Scientific Name Status			ıs	Survey Period	
	Colemano Mane	State Federal		Survey Feriou	
goldenseal	Hydrastis canadensis	Т	*	Apr - Sep	
sedge	Carex squarrosa	SC	*	May - Jun	
short-fruited rush	Juncus brachycarpus	Т	*	Jul - Oct	
Sullivant's milkweed	Asclepias sullivantii	Т	*	Jul - Aug	
water lotus	Nelumbo lutea	Т	*	Jun - Oct	
trailing wild bean	Strophostyles helvula	SC	*	Jul – Sep	
NOTES: SC – Special Concern; T – Threatened; E – Endangered; X – Extirpated; * - Not Listed					

Table 2. Target species for I-75 bridge replacement project areas.	
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Common Name	Scientific Name	Status		Survey Period
oonnon namo		State	Federal	
Virginia spiderwort	Tradescantia virginiana	SC	*	May - Jun
sedge	Carex squarrosa	SC	*	May - Jun
Sullivant's milkweed	Asclepias sullivantii	Т	*	Jul - Aug
arrowhead	Sagittaria montedivensis	Т	*	Aug - Sep
water lotus	Nelumbo lutea	Т	*	Jun - Oct
trailing wild bean	Strophostyles helvula	SC	*	Jul – Sep
NOTES: SC – Special Concern; T – Threatened; E – Endangered; X – Extirpated; * - Not Listed				

Results and Discussion - I-275 Re-surfacing

None of the target species were found in the project area. The most common plant assemblage throughout the project area was found to be early successional, or "old field" plant communities. Along significant stretches both native and non-native shrubs have become dominant, forming a canopy over the ditches, however, these shrub canopies are interspersed with openings containing a mixture of non-woody wetland species. These openings are frequently dominated by non-native Phragmites which also encroaches up the slope of the fore bank. Of the most abundant species recorded for the area, approximately half (9 of 20) are non-native. However, many individual plants beneficial to pollinators, both native and non-native, occur within the area, such as goldenrods and milkweeds. While the survey was not a total inventory of all species in the area, Table 3 presents a list of the most common species recorded.

Table 3. Plant species occ	urring commonly in the	I-275 Re-surf	acing pro	oject area.
Scientific Name	Common Name	Coefficient of Cons.	TES Status	Native/ Adventive/ Physiognomy
Agrostis stolonifera	creeping bent	*		Ad P-Grass
Andropogon gerardii	big bluestem	5		Nt P-Grass
Apios americana	groundnut	3		Nt P-Forb
Apocynum cannabinum	Indian hemp	3		Nt P-Forb
Asclepias incarnata	swamp milkweed	6		Nt P-Forb
Asclepias syriaca	common milkweed	1		Nt P-Forb
Asclepias verticillata	whorled milkweed	1		Nt P-Forb
Bromus inermis	smooth brome	*		Ad P-Grass
Calystegia sepium	hedge bindweed	2		Nt P-Forb
Carex vulpinoidea	sedge	1		Nt P-Sedge
Cirsium arvense	Canadian thistle	*		Ad P-Forb
Cornus foemina	gray dogwood	1		Nt Shrub
Daucus carota	Queen-Anne's-lace	*		Ad B-Forb
Dipsacus fullonum	common teasel	*		Ad P-Forb
Elaeagnus umbellata	autumn-olive	*		Ad Shrub
Euthamia graminifolia	grass-leaved goldenrod	3		Nt P-Forb
Frangula alnus	glossy buckthorn	*		Ad Shrub
Juncus dudleyi	Dudley's rush	1		Nt P-Forb
Juncus torreyi	Torrey's rush	4		Nt P-Forb
Lythrum salicaria	purple loosestrife	*		Ad P-Forb
Phragmites australis	reed	0		Nt P-Grass
Populus deltoides	cottonwood	1		Nt Tree
Rudbeckia hirta	black-eyed Susan	1		Nt P-Forb
Rumex crispus	curly dock	*		Ad P-Forb
Solidago altissima	tall goldenrod	1		Nt P-Forb
Toxicodendron radicans	poison-ivy	2		Nt W-Vine
Verbena hastata	blue vervain	4		Nt P-Forb
Vernonia missurica	Missouri ironweed	4		Nt P-Forb
Vitis riparia	riverbank grape	3		Nt W-Vine

The following are photos depicting typical conditions throughout the project area, as well as a few areas of note.



Figure 4. Typical old field mixture of grasses, forbs, and shrubs along ROW. West side of I-275 looking south from Wil Carleton Drive.







Figure 6. Typical non-woody, wetland species dominating opening.



Figure 7. Non-native Phragmites in open area of ditch and encroaching up the fore bank.

Results and Discussion - I-275 Nadeau Road Bridge

This project area has several notable features, including the presence of trailing wild bean (*Strophostyles helvula*). Four individuals were found on the west side of the northbound entrance ramp onto I-75. As this species is an annual, the individual plants found there will not survive until construction starts, however, it is quite likely that new plants will be present at the time of construction and it is highly likely that construction activities will impact the specific location where the beans were found. Thus, mitigation measures for this species are recommended (e.g. relocation of plants and soil from the specific site). The specific location of the trailing wild bean is presented in Table 4.

Table 4. Waypoints for significant biotic features.					
Feature	Latitude	Longitude			
Trailing wild bean	N 41 57.895	W 083 20.900			
Potential bat roost tree	N 41 57.821	W 083 21.113			

Additionally, a potential bat roost tree (snag) was found in the southwest cloverleaf of the interchange. Again, due its location, construction activities are likely to impact this snag. The snag should be evaluated as to its use by bats before construction begins. The specific location of the potential bat roost tree is presented in Table 4.

Significant areas of wetland, albeit of low quality, were also found at the project site. These are located on the eastside of the northbound entrance ramp and contained a large amount of nonnative Phragmites and non-native cattail. Additionally, the southeast cloverleaf at the interchange appears to be subject to intermittent flooding and supports a number wetland species. While these wetland areas are of low quality from a botanical standpoint, they no doubt provide some wetland ecosystem services such as stormwater retention and wildlife habitat. Aside from these features, the interchange is typified by mowed, old field plant communities. A list of the most common plants in the project area is presented in Table 5.

project area.				
Scientific Name	Common Name	Coefficient. of Cons.	TES Status	Native/ Adventive /Physiognomy
Ambrosia artemisiifolia	common ragweed	0		Nt A-Forb
Apocynum sibiricum	clasping dogbane	3		Nt P-Forb
Asclepias incarnata	swamp milkweed	6		Nt P-Forb
Cichorium intybus	chicory	*		Ad P-Forb
Cirsium arvense	Canada thistle	*		Ad P-Forb
Cornus foemina	gray dogwood	1		Nt Shrub
Cornus sericea (c. stolonifera)	red-osier dogwood	2		Nt Shrub
Daucus carota	Queen-Anne's-lace	*		Ad B-Forb
Dipsacus fullonum	common teasel	*		Ad P-Forb
Elaeagnus umbellate	autumn olive	*		Ad Shrub
Erigeron strigosus	daisy fleabane	4		Nt P-Forb
Eupatorium serotinum	late boneset	0		Nt P-Forb
Euthamia graminifolia	grass-leaved goldenrod	3		Nt P-Forb
Hordeum jubatum	squirrel-tail grass	*		Ad P-Grass
Lythrum salicaria	purple loosestrife	*		Ad P-Forb
Phalaris arundinacea	reed canary grass	0		Nt P-Grass
Phragmites australis	reed	0		Nt P-Grass
Poa compressa	Canada bluegrass	*		Ad P-Grass
Solidago altissima	tall goldenrod	1		Nt P-Forb
Typha angustifolia	narrow-leaved cattail	*		Ad P-Forb
Symphyotrichum laeve	smooth aster	5		Nt P-Forb
Verbascum thapsus	common mullein	*		Ad B-Forb

Table 5. Common plant species recorded in the Nadeau Road bridge replacement

The following are photos depicting typical conditions throughout the project area, as well as a few areas of note.



Figure 8. Trailing wild bean and associated plant species: nonnative reed (*Phragmites australis*) and smooth aster (Symphyotrichum leave).



Figure 9. Trailing wild bean close-up.



Figure 10. Wetland area dominated by *Phragmites* across entrance ramp from trailing wild bean.



Figure 11. Potential bat roost tree/snag.



Figure 12. Wetland area in SE cloverleaf showing signs of intermittent inundation and cattails

Results and Discussion - I-75 Swan Creek bridge replacement

None of the target species were found in the project area. The most common plant assemblage throughout the project area was found to be early successional, or "old field" plant communities. However, the area immediately associated with Swan Creek represents good quality riparian habitat. While the target species of *Sagittaria montedivensis* was not found, its congener *Sagittaria latifolia* was abundant. Care should be taken during construction to avoid disturbance to this riparian habitat and to avoid construction runoff and associated siltation from impacting Swan Creek. Commonly occurring species in the Swan Creek bridge replacement area are presented in Table 6.

Table 6. Commonly occurring plant species recorded in the Swan Creek project area.					
Scientific Name	Common Name	Coeff. of Cons.	TES Status	Native/ Adventive /Physiognomy	
Althaea officinalis	marsh mallow	*		Ad P-Forb	
Apocynum cannabinum	Indian hemp	3		Nt P-Forb	
Asclepias incarnata	swamp milkweed	6		Nt P-Forb	
Asclepias syriaca	common milkweed	1		Nt P-Forb	
Asclepias verticillata	whorled milkweed	1		Nt P-Forb	
Bromus inermis	smooth brome	*		Ad P-Grass	
Centaurea stoebe	spotted knapweed	*		Ad B-Forb	
Cichorium intybus	chicory	*		Ad P-Forb	
Cirsium arvense	Canada thistle	*		Ad P-Forb	
Cornus amomum	silky dogwood	2		Nt Shrub	
Cornus foemina (c. racemosa)	gray dogwood	1		Nt Shrub	
Cornus sericea (c. stolonifera)	red-osier dogwood	2		Nt Shrub	
Dipsacus fullonum	common teasel	*		Ad P-Forb	
Euthamia graminifolia	grass-leaved goldenrod	3		Nt P-Forb	
Phalaris arundinacea	reed canary grass	0		Nt P-Grass	
Poa pratensis	Kentucky bluegrass	*		Ad P-Grass	
Sagittaria latifolia	common arrowhead	1		Nt P-Forb	
Salix petiolaris	slender willow	1		Nt Shrub	
Toxicodendron radicans	poison-ivy	2		Nt W-Vine	
Typha angustifolia	narrow-leaved cattail	*		Ad P-Forb	
Verbascum blattaria	moth mullein	*		Ad B-Forb	
Verbascum thapsus	common mullein	*		Ad B-Forb	
Verbena urticifolia	white vervain	4		Nt P-Forb	
Vitis riparia	riverbank grape	3		Nt W-Vine	



Figure 13. Typical ROW in Swan Creek bridge replacement project area showing propensity of Canada thistle.



Figure 14. Arrowhead (*S. latifolia*) and typical riparian plant community along Swan Creek.

Acknowledgements

The authors wish to thank MDOT for providing this opportunity to survey this corridor.

Literature Cited

Michigan Natural Features Inventory. 2020. Abstracts for Michigan's Rare Plant Species. <u>https://mnfi.anr.msu.edu/species/plants</u>.

NatureServe. 2020. Element Occurrence Data Standard. <u>https://www.natureserve.org/conservation-tools/element-occurrence-data-standard</u>.

Trailing wild bean Special Plant Form

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ition distribution (e.g., widely scattered, dense clumps, evenly distributed throughout):	
Michigan Natural Features Inventory, P.O.Box 30444, Lansing, MI 48909-7	

Phenology: Indicate the num	ber observed in each catego	ry (or X if numbers are unk	nown):		
4 In leaf In b	ud In flower	Immature fruit	Mature fruit	Seed dispersing	Dormant
CONDITION					
EVIDENCE OF REPRODUCTION	? Yes 🔀 No 📃 Un	known Explain:			
EVIDENCE OF DISEASE/PREDAT	FION:				
ANIMAL POLLINA TORS observe	ed on the plant (list species):				
LANDSCAPE DESCRIPTION ANI agriculture, wetland drainage)	D SETTING: Describe the surr	rounding landform(s) prese	ent, natural communities,	historic and current human	impacts (e.g.,logging,
Portion of interstate highway o	on ramp system. Area is mair	nly mowed interchange.			
	ha tha chacific habitat ar mir	crobabitat whore this plant	occurs. Convous montal	image of the babitat includ	ing landform vogotation clone
aspect, soils, ecological proces	ses and natural disturbance	(e.g., windthrow, fire, wate	r level fluctuations)	image of the habitat includ	ing ianuform, vegetation, slope
Nowed interstate right-of-way	1.				
	Aspect:	Slope:	Light:	Position:	Moisture:
TOPOGRAPHY	Aspect:	Slope: 🔀 Flat	Light: 🔀 Open	Position:	Moisture:
TOPOGRAPHY Elevation: ft.	Aspect:	Slope: X Flat 0-10	Light: 🔀 Open 📃 Partial	Position: Crest Upper slope	Moisture:
TOPOGRAPHY Elevation: ft. If elevation is a range:	Aspect: N NE E NW S SE	Slope: Flat 0-10 10-35	Light: Open Partial Filtered	Position: Crest Upper slope Mid slope	Moisture: Inundated Saturated (wet-mesic Moist (mesic)
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft.	Aspect: N NE E NW S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical	Light: Open Partial Filtered Shade	Position: Crest Upper slope Mid slope Lower slope	Moisture: Inundated Saturated (wet-mesic) Moist (mesic) Dry-mesic
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft. Maximum: ft.	Aspect: N NE E NW S S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical	Light: Open Partial Filtered Shade	Position: Crest Upper slope Mid slope Lower slope Bottom	Moisture: Inundated Saturated (wet-mesic Moist (mesic) Dry-mesic Dry (xeric)
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft. Maximum: ft. Associated species	Aspect: N NE E NW S S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical	Light: Open Partial Filtered Shade	Position: Crest Upper slope Mid slope Lower slope Bottom	Moisture: Inundated Saturated (wet-mesic) Moist (mesic) Dry-mesic Dry (xeric)
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft. Maximum: ft. Associated species Overstory/Tree Species:	Aspect: N NE E NW S S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical Understory Species:	Light: Open Partial Filtered Shade	Position: Crest Upper slope Mid slope Lower slope Bottom	Moisture: Inundated Saturated (wet-mesic) Moist (mesic) Dry-mesic Dry (xeric) 90 % cover
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft. Maximum: ft. ASSOCIATED SPECIES Overstory/Tree Species:	Aspect: N NE E NW S S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical Understory Species:	Light: Open Partial Filtered Shade	Position: Crest Upper slope Mid slope Lower slope Bottom Ground cover: Smooth aster (Sym	Moisture: Inundated Saturated (wet-mesic) Moist (mesic) Dry-mesic Dry (xeric) 90 % cover plotrichum laeve)
TOPOGRAPHY Elevation: ft. If elevation is a range: Minimum: ft. Maximum: ft. ASSOCIATED SPECIES Overstory/Tree Species:	Aspect: N N NE E NW S S SE W SW	Slope: Flat 0-10 10-35 35+ Vertical Understory Species:	Light: Open Partial Filtered Shade % cover	Position: Crest Upper slope Mid slope Lower slope Bottom Ground cover: Smooth aster (Sym Reed (Phragmites a	Moisture: Inundated Saturated (wet-mesic) Moist (mesic) Dry-mesic Dry (xeric) 90 % cover plotrichum laeve) ustralis)
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THREATS AND HUMAN DISTURBANCES OR IMPACTS to this occurrence: (e.g., grazing, logging, ditching and drainage, ORV use, fire suppression)
Ditching, highway maintenance, proposed construction activities.

INVASIVE SPECIES PRESENT? : Yes INVASIVE SPECIES PRESENT? : Section 2010 Invasive Advances and the section of t

POTENTIAL THREATS to this occurrence:

Proposed construction activities.

MANAGEMENT AND PROTECTION

Management (including stewardship and restoration) for the Element at this location (e.g., burn periodically, open the canopy, control invasives, remove drainage ditches, clear blocked culvert, break drain tile, reduce deer densities, study effects of herbivore impacts)

Relocate seed bank.

Monitoring and Research Needs for the Element at this location (e.g., study effect of herbivore impacts, etc.)

Protection Needs for the Element at this location (e.g., protect the entire marsh, the slope and crest of slope, the fen and upland, ban ORVs, etc.)

MAP (mandatory)

- 1. Attach appropriate part of a USGS topographic map or map showing exact locations of species. Image can be uploaded into the Map Insert field located at the end of this form or clearly associated with this form once completed.
- 2. Indicate on the map the exact location of the observation(s):
- a. When the observation area is no larger then a pen point on the map (i.e., only a small number of individuals or extremely small patches), place small points on the map indicating the location(s) of the individuals or patches, and label each point with an arrow so they are more easily seen.
- b. When the observed area is *larger then a pen point* on the map. (e.g., a population of plants, foraging birds):
 (1) Draw a thin solid boundary line showing the extent of the observed area occupied by the individuals.

 - (2) Indicate disjunct patches (polygons) by drawing the boundary for each patch separately.
 - (3) If the boundary follows the edge of a lake, stream, road, marsh or other feature, draw the boundary precisely on the edge of the feature.

(4) When needed, add notes to the map with instruction on where the boundary line is located or if the boundary is shared with other observations.

3. A hand drawn sketch may be included for finer details.

LOCATIONAL CERTAINTY

ls your depiction of the observed area on the map within 6.25 m (approx. 20ft) of its actual location on the ground? 🛛 📉 Yes 📃 No

If No, complete the following:

a. Estimate of uncertainty distance: based on landmarks, elevation, etc., the location of the observed area on the map is accurate to within

6m Meters Kilometers Feet Miles of its actual location on the ground.

b. Is the observed area known to be located within some feature(s) on the map (e.g., wetland boundary, lake, road, trail, highway, contour lines)? 📃 Yes 🛛 🔀 No If Yes, indicate the boundary within which the observed area is known to be located on the map line, and if applicable, identify the feature (e.g., marsh).

Michigan Natural Features Inventory, P.O.Box 30444, Lansing, MI 48909-7944 PHONE: (517) 373-1552 MSU is an affirmative-action, equal-opportunity institution.

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