Rare Plant Surveys for the Michigan Department of Transportation: US-24 at Stony Creek. Project #211089, Monroe, Michigan

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Cover: Stony Creek at US-24 and South Stony Creek Rd. Photo by Amanda K. Klain.

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Abstract

Foot surveys for rare plant species were conducted along portions of the rights-of-way (ROW) surrounding the bridge crossing of US-24 at Stony Creek just north of the US-24 and M-125 intersection in Monroe County. This area is proposed for bridge and traffic maintenance work.

The surveys of the vegetation immediately surrounding the bridge revealed mesic hardwood forests that slope steeply down to a disturbed floodplain forest along the creek on both sides of the bridge. Native tree species dominate, and the forested understory consists of mostly non-native shrubs, and a dense ground vegetation mixture of native and non-native forbs. The floodplain forest houses some species with relatively high coefficients of conservatism (C) indicating a high level of ecological integrity. The rest of the ROW and buffer zones outside of the immediate bridge zone are generally dominated by a mixture of native and non-native early successional plants, mowed lawn, and paved entrances, which lack suitable habitat for target species.

None of the target species for this project were found. Invasive reed is just beginning to spread into the floodplain and appears to have an isolated origin that will allow successful immediate control, which is recommended.

Introduction

This report is a summary of rare plant surveys conducted along portions of US-24 at Stony Creek in Monroe County. Project #211089 is 4.5 miles north of the city of Monroe and is centered around the bridge crossing over Stony Creek near where south Stony Creek Rd. and US-24 intersect just north of the US-24 and M-125 intersection. The project area includes the MDOT ROW (rights-of-way) adjacent to the bridge and extending 50-100 feet wide on both sides, as well as a 500 ft. buffer on both ends of the project area (Fig. 1). The Stony Creek Watershed is long and narrow, about 32 miles long and eight miles at its widest. It is oriented northwest to south-east and tapers as it drains toward Lake Erie just north of Monroe, MI (Figure 2).

These rare plant surveys are required prior to reconstruction and rehabilitation of these portions of the highway to ensure regulatory compliance with state and federal endangered species acts. This project consists of bridge work including full deck patching, epoxy overlay, joint replacement, substructure patching, epoxy crack injection, riprap installation and maintaining traffic along US-24 and S. Stony Creek Rd.

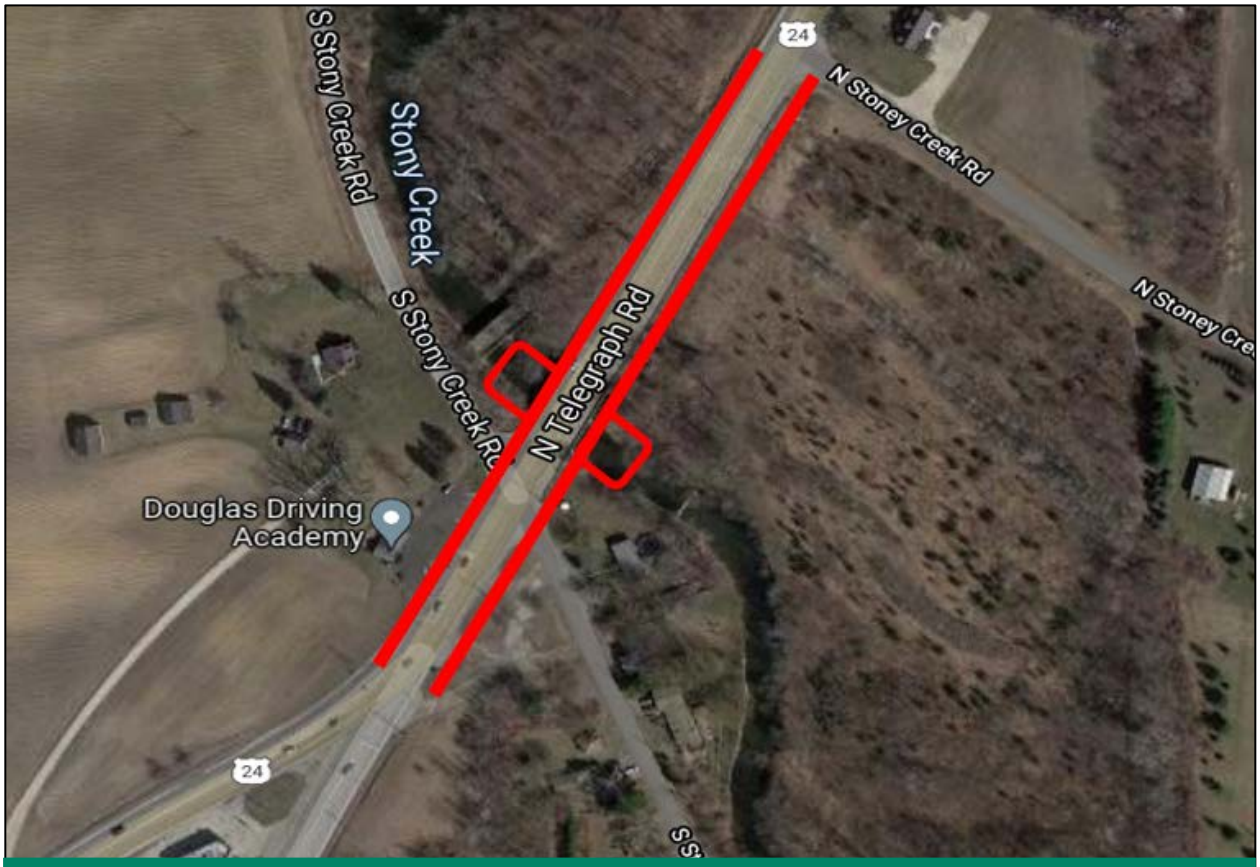

Figure 1. Map of the project area.

Figure 2. Location of Stony Creek Watershed.

Methods

A review of the Michigan Natural Heritage database was conducted to identify species listed as endangered, threatened, or special[1] concern with potential to occur in the project area (Fig. 1). The area was divided into two segments for survey. Segment 1 is the west side of US-24 including the 50-100' wide area at the bridge and the 500 ft. buffer on each end. Segment 2 includes the same on the east side.

Five species were identified, and surveys were conducted to coincide with their optimal detection periods (Table 1). Early season surveys were conducted on July 1, 2021. Mid- and late-season surveys were combined because optimal survey periods overlap, and one visit was sufficient to capture them all for this small project area. They were conducted on August 15, 2021.

Figure 3. Survey perimeters and segments in project area.

On-foot meander surveys were conducted in all areas shown within the red and purple lines in Figure 3. Surveys focused on suitable habitat for target species, but the surveyor aimed to capture all micro-habitats and any rare species present. Pictures and general habitat conditions, dominant plant species, and populations of rare and notable invasive plant species were recorded. Notable invasive species include species for which management by MDOT can make a significant impact by containing their spread. Rare plant and notable invasive plant occurrences were marked with GPS points using an Android phone or a Samsung tablet. Associated data for rare plant occurrences were entered into Survey 123 for upload to the MNFI natural heritage database, Biotics.

[1] State and federal endangered and threatened status are codified under Part 365 of PA 451, 1994 Michigan Natural Resources and Environmental Protection Act; special concern status is a NatureServe designation.

Table 1. Early-season targets, their status, and optimal survey periods.			
Scientific Name	**Common Name**	**Listing Status**	**Best Survey Period**
Tradescantia virginiana	Virginia spiderwort	Special Concern	late May - end of June

Table 2. Mid- to late-season targets, their status, and optimal survey periods.			
Scientific Name	**Common Name**	**Listing Status**	**Best Survey Period**
Asclepias sullivantii	Sullivant's milkweed	Threatened	July – August
Justicia americana	water-willow	Threatened	August – September
Strophostyles helvula	trailing wild bean	Special Concern	end of July – September
Zizania aquatica	wild rice	Threatened	July - late September

Results

Overview

The area immediately surrounding the US-24 bridge is mesic hardwood forest that slopes steeply down to a disturbed floodplain forest along the creek (Fig. 4). Mature trees near the road-level include bitternut hickory (*Carya cordiformis*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), and American elm (*Ulmus americana*). Dominant trees in the floodplain include silver maple (*Acer saccharinum*), hackberry, green ash (*Fraxinus pennsylvanica*), cottonwood (*Populus deltoides*), and basswood (*Tilia americana*). The understory is mostly non-native honeysuckles (*Lonicera sp.*) with some native rough-leaved dogwood (*Cornus drummondii*), and gray dogwood (*C. foemina*) interspersed. The ground vegetation is a dense mixture of native and non-native forbs. The buffer zones along US-24 are generally dominated by a mixture of native and non-native early successional plants and lack suitable habitat for target species. The southern buffer is mainly mowed lawn and paved entrances. No rare species were documented during surveys.

Descriptions of Survey Segments

<u>Segment 1</u>: West side of the bridge and buffers along US-24.

This segment of the project is predominantly mesic forest with a steep slope downward to a seasonally wet floodplain forest adjacent to the creek. The floodplain forest has a dense and diverse ground cover of mostly native species, although it is disturbed throughout and has scattered openings (Fig. 5) There is a small island on the northwest side of the bridge that is dominated by silver maple and hackberry, with forbs such as showy cardinal flower (*Lobelia cardinalis*) and ironweed (*Vernonia missurica*). The floodplain forest contains some highly conservative species, including green dragon (*Arisaema dracontium*; C=8[2]; Fig. 6), lizard's tail (*Saururus cernuus;* C=9), fog-fruit (*Phyla lanceolata*; C=6: Fig. 7), and cut-leaf coneflower (*Rudbeckia laciniata*; C=6; Fig. 8). North along US-24 there is a caged utility building with invasive reed (*Phragmites australis* subsp. *australis*) that is beginning to spread into openings

[2] C=Coefficient of conservatism: a number from 0-10 assigned to native species, with higher numbers indicating increasing fidelity to natural communities present prior to widespread European settlement.

within the floodplain forest (Fig. 9). Invasive moneywort (*Lysimachia nummularia*) forms carpets in some areas.

Figure 4. Bridge and ROW at US-24 over Stony Creek.

Figure 5. Opening in the floodplain forest.

Figure 6. Green dragon in the flood plain forest at Stony Creek.

Figure 7. Fog-fruit in the floodplain forest at Stony Creek.

Figure 8. Cut-leaf coneflower in the floodplain forest at Stony Creek.

Figure 9. Invasive reed (phragmites) establishing in the floodplain.

At the road-level along the US-24 is a disturbed herbaceous edge including Canada thistle (*Cirsium arvense*), wild carrot (*Daucus carota*), cut-leaf teasel (*Dipsacus laciniata*), quack grass (*Elymus repens*), tall fescue (*Lolium arundinacea*), and reed canary grass (*Phalaris arundinacea*). Siberian elm (*Ulmus pumila*) and white mulberry (*Morus alba*) occur at the corner of S. Stony Creek Rd. and US-24, along with native black walnut (*Juglans nigra*) and bitternut hickory (*Carya cordiformis*).

The entire southern buffer zone is comprised of businesses with mowed lawn and driveways and has no suitable habitat for the target species (Fig. 10).

Figure 10. Unsuitable habitat south of the bridge.

<u>Segment 2:</u> East side of the bridge and buffers along US-24

The area surrounding the bridge on the east side is similarly dominated by a hardwood forest that slopes down to the floodplain forest. The slope on this side is much more extreme and densely vegetated. Amongst species already noted above, riverbank grape (*Vitis riparia*) forms impenetrable masses of vines and surveys were conducted from the edges of the slope. There is a dense monoculture of reed canary grass (*Phalaris arundinacea*) at the creek edge elbowing out into the creek (Fig. 11). The area at the south side of the creek edge is mowed and looks private (Fig. 12).

Figure 11. Reed canary grass along and in Stony Creek on the north side.

Figure 12. Unsuitable habitat on the south side of the creek and bridge.

The east side north of the bridge is an open wet successional meadow (Fig. 13) with native river-bank grape, Indian hemp (*Apocynum cannabinum*), common milkweed (*Asclepias syriaca*), ironweed (*Vernonia missurica*), and goldenrods (*Solidago* spp.). These are interspersed with non-native cut-leaf teasel (*Dipsacus laciniatus*), narrow-leaved cat-tail (*Typha angustifolia*), smooth brome (*Bromus inermis*), and tall fescue (*Lolium arundinaceum*).

The entire southern buffer zone on the east side like the west side is comprised of businesses with mowed lawns and driveways and has no suitable habitat for the target species.

Figure 13. Disturbed herbaceous ROW north of the bridge.

Discussion

Potentially suitable habitat for water willow and wild rice occurs in Stony Creek, although perhaps marginal because of the relatively small size of the creek, and neither were found. The open wet successional meadow along the east side, north of the bridge provides potential habitat for trailing wild bean, Virginia spiderwort, and possibly Sullivant's milkweed, but these were not found either. The mesic northern forest and the floodplain forest, although disturbed, both retain some conservative species and are not yet widely invaded. They are vulnerable to disturbance by the bridge work which could facilitate the spread of invasive species. Work on the bridge should try to minimize disturbance and block invasion pathways as much as possible. Phragmites is just beginning to spread into the floodplain, and it thus far has an isolated origin. Immediate control is recommended. Decontamination of equipment is also recommended to avoid introducing invasive species that are not yet present.

Acknowledgements

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Literature Cited

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Michigan Flora Online https://michiganflora.net/

Appendices

Appendix 1. List of common species in the floodplain forest at Stony Creek[1]				
Scientific Name	**Common Name**	**Native or Nonnative**	**C[1]**	**W[2]**
Acer saccharinum	silver maple	Native	2	-3
Arisaema dracontium	Green dragon	Native	8	-3
Carex lupulina	Hop-sedge	Native	4	-5
Carya cordiformis	bitternut hickory	Native	5	0
Celtis occidentalis	hackberry	Native	5	0
Cephalanthus occidentalis	Buttonbush	Native	7	-5
Cornus drummondii	rough-leaved dogwood	Native	6	0
Cornus foemina	gray dogwood	Native	1	0
Fraxinus Pennsylvania	green ash	Native	2	-3
Glyceria striata	fowl manna grass	Native	4	-5
Iris virginica	southern blue flag	Native	5	-5
Juglans nigra	black walnut	Native	5	3
Lobelia cardinalis	cardinal flower	Native	7	-5
Lonicera sp.	honeysuckle	Non-native	X	3 or 5
Lysimachia nummularia	moneywort	Non-native	X	-3
Phalaris arundinacea	reed canary grass	Native	0	3
Phyla lanceolata	fog-fruit	Native	6	-5
Phragmites australis subs. australis	reed (phragmites)	Non-native	X	-3
Populus deltoids	cottonwood	Native	1	0
Rudbeckia laciniata	tall yellow coneflower	Native	6	-3
Saururus cernuus	lizards-tail	Native	9	-5
Sium suave	water-parsnip	Native	5	-5
Tilia americana	basswood	Native	5	3
Toxicodendron radicans	poison-ivy	Native	2	0
Ulmus americana	American elm	Native	1	-3
Vernonia missurica	Missouri ironweed	Native	4	0
Vitis riparia	riverbank grape	Native	3	0

[1]Species observed during two site visits, not an exhaustive survey.
[2]Coefficient of Conservatism: Ranges from 0-10 for native species with increasing fidelity to habitat present prior to widespread European settlement. 0: low fidelity; 10: high fidelity.
[3]Wetland Coefficient: Ranges from -5 to 5 for all species based on fidelity to wetland habitat; -5: obligate wetland species; +5: obligate upland species.