Rare Plant Surveys for the Michigan Department of Transportation: Railroad Crossing Culvert in Ann Arbor. Project #1004E, Washtenaw County

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Cover: Railroad tracks that run through the site, by Amanda K. Klain.

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Abstract

Foot surveys for rare plant species were conducted in the area around the railroad crossing culvert near Barton and Plymouth Roads in Ann Arbor, Washtenaw County which is proposed for replacement.

The surveys revealed unsuitable habitat with dense thickets and tangles of non-native species throughout much of the area with a high level of habitat degradation and erosion immediately around the culverts. Presumable pesticide damage to the vegetation running adjacent along much of the railroad ballast edge was observed, particularly in the southern extent. These edges are composed of a mix of native early successional herbaceous species and non-native invasive species. This site has some historical botanical significance that is now absent because of recent periods of intensive land use.

None of the target species for this project were found in the project area. Based on the pervasiveness of invasive species and the preponderance of unsuitable habitat, the culvert replacement construction is likely to have no significant long-term impacts to the project area.

Introduction

This report is a summary of rare plant surveys conducted at the railroad crossing culvert that is one quarter of a mile northeast of Barton Rd. and just northwest of Plymouth Road in Ann Arbor, Washtenaw County. Project #1004E consists of the culvert crossing that flows under the railroad tracks. The survey area included a 50-foot-wide buffer on both sides at the culvert crossing and along the railroad ROW (rights-of-way) for 500 feet in both directions at each end (Figs. 1, 2).

These rare plant surveys are required prior to replacement of these portions of the railroad crossing culvert to ensure regulatory compliance for the state and federal endangered species acts.

Figure 1. Project area showing segments that were surveyed.

Figure 2. A culvert crosses under the railroad tracks in the center of the site.

Methods

A review of the Michigan Natural Heritage database was conducted to identify species listed as Threatened, Endangered, or Special Concern[1] under the state and federal Endangered Species Acts that have been previously documented within a two-mile radius of the survey project area.

Seven species were identified as targets for early, mid, and late-season surveys based upon their optimal survey periods (Table 1). The early-season survey was conducted on June 11, 2021, and targeted purple twayblade (*Liparis liliifolia*) and goldenseal (*Hydrastis canadensis*). The mid-season survey was conducted on July 24, 2021, and focused on Virginia snakeroot (*Endodeca serpentaria*), upland boneset (*Eupatorium sessilifolium*), and black haw (*Viburnum prunifolium*). Pink turtlehead (*Chelone obliqua*) and stiff gentian (*Gentianella quinquefolia*) were targeted during the late-season survey, conducted on October 11, 2021. The latter survey was confined to the west side of the culvert crossing area at and around the Gabion cage of rocks and small pond. Surveys focused on the species noted above, however, the surveyor aimed to capture all micro-habitats and associated species along the corridor in case other rarities were present, but not yet documented.

[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 status is a NatureServe designation.

Foot surveys were conducted by meander survey along the railroad ROW at the culvert crossing, including 50 feet perpendicular on both sides of culvert crossing and extending 500 feet from the culvert in each direction along both sides of the tracks (Fig. 1). The entire survey area was walked during the early survey period, to identify unsuitable habitat for later season targets. These areas were avoided during later season surveys.

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

Scientific Name	Common Name	Listing Status	Best Survey Period
Chelone obliqua	pink turtlehead	Endangered	September - mid-October
Endodeca serpentaria	Virginia snakeroot	Threatened	July - August
Eupatorium sessilifolium	upland boneset	Threatened	late-July - September
Gentianella quinquefolia	stiff gentian	Threatened	September - October
Hydrastis canadensis	goldenseal	Threatened	mid-April – mid-September
Liparis liliifolia	purple twayblade	Special Concern	June - August
Viburnum prunifolium	black haw	Special Concern	July - September

The railroad tracks are lined on each side with crushed stone or 'ballast' which is an important part of the railroad infrastructure (cover photo). This ballast extends approximately 10-15 feet on both sides of the tracks and is sloped downward away from the tracks. At the culvert and on all sides approaching the culvert the ballasted slopes are very steep and challenging to navigate; these areas were surveyed while standing on the ballast and visually observing the vegetation from 5 to15 feet away. No significant impacts to the thoroughness of the surveys are believed to have occurred because of this.

Notes and pictures of general habitat conditions, dominant plant species, and populations of rare species and notable invasive plants in the three segments of the project area were recorded. Notable invasive plant species include those that and commonly known to pose a high threat to native ecosystems and for which management by MDOT can potentially make a significant impact by containing their spread. We also noted potentially invasive non-native plants that are of concern based upon their behavior in other places with similar conditions. When rare plant occurrences and notable invasive species populations were found, they were marked with GPS points using an Android phone or a Samsung tablet. Associated data for rare plant occurrences were also entered in Survey 123, for upload to the MNFI database, Biotics.

Results

Overview

Much of the project area is unsuitable habitat with dense thickets and tangles of non-native species throughout. The southern half of the railroad ROW on the east side of the tracks in Segment 1 and the east side of Segment 2 where the culvert crosses the tracks are also unsuitable habitat due to severe erosion and habitat degradation. There also appears to be pesticide damage to the first two to three feet of vegetation at the ballast edge, running along

both sides of the tracks in Segment one and in scattered locations elsewhere along the railroad ROW (Figs. 3, 4).

Figure 3. Pokeweed presumably damaged by broadcasted herbicide.

Figure 4. Vegetation presumably damaged by broadcasted herbicide.

On the west side of the culvert crossing that leads down to Traver Creek, there is a Gabion wall—a stepped foundation to control erosion at the culvert (Figure 5). It is basically a large cage of rocks formed in a series of steps from the culvert pipe down to the creek. This cage of rocks has vegetation, even trees, growing up through it which resulted from organic matter getting into the rock cracks and is harmless to the structure.

The project area is generally dominated by common buckthorn (*Rhamnus cathartica*) and honeysuckle (*Lonicera sp.*) thickets, with an herbaceous zone closer to the tracks that is dominated by native forbs including big bluestem (*Andropogon gerardii*), bee balm (*Monarda fistulosa*), and black-eyed Susan (*Rudbeckia hirta*), as well as non-native species including Canada thistle (*Cirsium arvense*), and mullein (*Verbascum thapsus*).

No suitable habitat for the target species was documented during surveys and none of the target species were observed in the project area.

Figure 5. Gabion wall stepped foundation leading down to Traver Creek in Segment 2.

Descriptions of Survey Segments

Segment 1: **Southern extent of project area from culvert, and 500 feet southwest.**

Each side of the railroad tracks in this segment is generally composed of a mix of native early successional herbaceous species and non-native invasive species (Fig. 6). The west side of the tracks is more degraded with shrubby thickets of Amur honeysuckle (*Lonicera maackii*) and

common buckthorn. The railroad ROW grades to a steep slope on the west side as it approaches the culvert crossing.

Figure 6. East side of Segment 1 showing early successional meadow species.

Other tree and shrub species found in this segment include native box elder (*Acer negundo*), juniper tree (*Juniperus virginiana*), cottonwood (*Populus deltoides*), and willows (*Salix spp*.), with non-native Amur honeysuckle, and invasive Oriental bittersweet (*Celastrus orbiculatus*). The dominant herbaceous layer species include native white snakeroot (*Ageratina altissima*), big bluestem, beggar's lice (*Hackelia virginiana*), and pokeweed (*Phytolacca americana*) and non-native dame's rocket (*Hesperis matronalis*), catnip (*Nepeta cataria*), and foxtail (*Setaria* sp.*).* The east side of the tracks is an open field successional habitat with few woody species. Native pollinator species include common milkweed (*Asclepias syriaca*), grass-leaved goldenrod *(Euthamia graminifolia*), bee balm, evening primrose (*Oenothera biennis*), goldenrods (*Solidago spp*.) and wood sage (*Teucrium canadense*). Dominant non-native species include smooth brome (*Bromus inermus*), spotted knapweed (*Centaurea stoebe*), Canada thistle, wild carrot (*Daucus carota*), and crown-vetch (*Securigera varia*).

Particularly noteworthy elements: An introduced (non-native) sedge species (*Carex spicata*) was observed along the southeast side of the railroad track ROW (Figure 7). This species is one of only a few non-native sedges that are known to be introduced in Michigan; there are only four previous documentations of this species in the state. One of these was also found in Ann Arbor, several miles away from this new occurrence. *Carex spicata* can be distinguished by its dark, blackish purple perigynia just past maturity. Along both sides of the railroad tracks the vegetation appears to be suffering from herbicide damage as seen in Figures 3 and 4.

Figure 7. *Carex spicata* in Segment 1.

Notable Invasive Species: Species of concern include the well-known, high-threat invasive vine, Oriental bittersweet, and the potentially invasive elecampane (*Inula helenium*). Elecampane is a very robust (up to 2 meters tall), large-leaved, rhizomatous species in the aster family that is naturalizing in the Northeastern and Northwestern United States and has shown to be aggressive in natural areas.

Segment 2: The culvert crossing and adjacent 50 ft of survey area (Fig. 8).

The immediate area around the culvert is highly disturbed and severely degraded habitat (Fig. 9-11). The east side of the culvert consists of downed trees and log debris amongst a very dense “forest” of mature Amur honeysuckle and common buckthorn. These shrubs have created such deep shade that little to no ground vegetation is present. On the west side of the tracks along the Gabion wall stepped foundation there is a steep slope that grades from the ballast into dense vegetative thickets of similar weedy species listed in Segment 1 above.

Figure 8. Culvert area in Segment 2.

Figure 9. Severe erosion on east side of railroad tracks just south of the culvert in Segment 2.

Figure 10: Habitat degradation on the east side of the culvert in Segment 2.

Figure 11: Vegetated Gabion foundation, showing small pond with pickerel-weed on the right side.

The 50-foot buffer around the culvert in and around the Gabion foundation is part of the riparian habitat associated with Traver Creek and includes a mix of moisture-loving native species including (sedges (*Carex* spp.), boneset (*Eupatorium perfoliatum)*, fowl manna grass (*Glyceria striata*), jewelweed (*Impatiens capensis*), pokeweed, and quaking aspen (*Populus tremuloides*). Many non-native and invasive species occur here as well, including (orchard grass (*Dactylis glomerata*), teasel (*Dipsacus* sp.), dames rocket, motherwort (*Leonurus cardiaca*), and multiflora rose (*Rosa multiflora*), willows, and crown-vetch.

There is an open small pond on the southeast side of the Gabion foundation with aquatic species including water plantain (*Alisma sp.*), duckweeds (*Lemna* spp.) and pickerel-weed (*Pontederia cordata*) (Fig. 11). The Gabion foundation was once part of a rich prairie fen remnant that has been destroyed through intensive land use (Appendix A).

Particularly noteworthy elements: There is severe erosion and habitat degradation on the east side of culvert (Fig. 9 & 10); it has been used as a dumping ground or possibly an encampment of sorts, indicated by significant amounts of garbage (Figure 12).

Figure 12: A garbage dump on the east side of the culvert in Segment 2.

Notable Invasive and Potentially Invasive Species: Oriental bittersweet, glossy buckthorn (*Frangula alnus*), and black locust (*Robinia pseudoacacia*) are common in Segment 2.

<u>Segment 3</u>: Northern extent of project area, from the culvert 500 feet northeast.

This segment contains the same open, early successional species as listed in Segment 1, though it is slightly less disturbed. On both sides of the tracks north of the culvert, native species

such as black cherry (*Prunus serotina*), gray dogwood (*Cornus foemina*), red cedar, black eyed Susan, and big blue stem persist. The area directly surrounding the culvert is dominated by non-native species including Amur honeysuckle, common buckthorn, spotted knapweed, Canada thistle, and mullein.

Notable Invasive Species: All the non-native species noted in this segment are widespread invasive or nuisance species.

Discussion

The riparian area of Traver Creek runs parallel to and is downslope of the railroad tracks, though outside of the project area by approximately 20-30 feet. It is likely that herbicide and invasive species seeds travel down the slope and enter the riparian zone with negative impacts to native species. It is recommended to stop or limit herbicide use especially along the west side of the railroad ROW. The invasive species infestations are so widespread that aggressive treatment (broadcast herbicide applications, mechanical removal of woody plants) seems futile, and it is better recommended to target individuals/populations at 1-3-year intervals by means of hand pulling and cutting.

Based on the already high level of ecological disturbance and the density and pervasiveness of invasive species, it is likely that any detrimental changes to the ecological integrity of the immediate area will be limited to short-term native mammal, amphibian, and insect displacement caused by the construction, from which recovery will be possible.

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Appendix 1. A Bit of History

In the 1960's there was a local botanist named Louis Ludwig who lived on the Northside of Ann Arbor who heavily botanized the surrounding natural areas, collecting thousands of plant specimens. He collected within the project area until it was clear cut in 2006. It was one of two rich prairie fen remnants within the confines of Ann Arbor with a high diversity of interesting plant species. Unfortunately, after Louis passed away in 2000, his relatives dumped all his thousands of pressed plants in a dumpster. The University of Michigan Herbarium Curator Tony Reznicek and local botanist Sylvia Taylor heard about the situation and high-tailed it to the dumpster, but they were a couple of dumpsters too late, and the collections were gone forever. We do know that he collected some neat species in the fen, like grass-pink orchid (*Calopogon tuberosus*), rose Pogonia orchid (*Pogonia ophioglossoides*), bog-sedge (*Carex limosa*), nut-rush (*Scleria verticillata*), white lady slipper (*Cypripedium candidum*; State threatened), false asphodel (*Triantha glutinosa*), and undoubtedly many more lost records.

The area which had sat untouched for decades was denied protection by the city of Ann Arbor and bought by a developer who clear cut a 4.6-acre parcel in 2016. Even after several clear cuts and subsequent fallow periods (the developer went bankrupt), the area was heavily botanized for 10 years with new and interesting species found every year in that isolated pocket. Unfortunately, the area has been severely degraded due to multiple, repeated disturbances and lack of stewardship, and what once was a lush and diverse area as recently as 2005 is now virtually unrecognizable in a botanical sense.