

Rare Plant Species Surveys for the Michigan Department of Transportation: M-139 over the Franz and Notten Drain, Berrien County. MDOT Project No. 894E



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Cover: Clockwise from top left: Prairie trillium (*Trillium recurvatum*) in woods; creek, and current culvert. Photos by Julie McLaughlin. MNFI surveyor looking for trillium plants along creek floodplain. Photo by Elizabeth Haber.

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Abstract

The section of M-139 at Franz and Notten Drain contains significant populations of state threatened *Trillium recurvatum* which may be impacted by planned culvert replacement or other road improvements. A survey conducted as a follow-up to a 2018 survey, resulted in the location of 682 individual plants of state threatened *Trillium recurvatum* and 236 of state threatened *Trillium sessile* within the road right-of-way. Recommendations include limiting the construction footprint to already disturbed areas; maintaining an intact canopy; treating invasive species, and where impacts are unavoidable, transplanting to another suitable location.

Introductions and Methods

A summary of rare plant surveys for MDOT project area 894E is presented in this report. These surveys are required to ensure compliance with regulations regarding potential impacts of road improvement projects on rare species. This site was originally surveyed in 2018 and a sizable population of state threatened prairie trillium (*Trillium recurvatum*) was documented. The purpose of the current survey was to document the locations, number of individuals, and status of the known population more accurately (Schuen 2022). The project area is in Berrien County and spans a bridge and culvert of the Franz and Notten Drain located on M-139/Front Street south of Ullery Road (Figs. 1, 2). The culvert has failed and will be replaced.



Figure 1. Overview map of MDOT project area 894E shown by red dot. The project area is located on M-139/Front Street south of Ullery Road.



Figure 2. Location map of MDOT project area 894E.



Survey efforts focused on revisiting the population of prairie trillium found in 2018 (Fig. 3), while also surveying for other rare plant species, with a particular focus on those that have been observed within a two-mile buffer of the project area (Table 1).

Two surveys were conducted during the 2022 growing season. These corresponded as closely as possible to early and mid-season phenology to capture the changing plant species composition and abundance over the growing season and to maximize the chances to observe the target rare plant species. The early survey was conducted on May 24 and the mid-season survey on July 18.

Figure 3. Map of prairie trillium (*Trillium recurvatum*) located during the 2018 survey.

Table 1: Documented occurrences of rare plant species within two miles of the project area.

Latin name	Common name	State status*	Optimal survey time
<i>Camassia scilloides</i>	wild hyacinth	T	early spring – early summer
<i>Collinsia verna</i>	blue-eyed Mary	SC	mid-spring – early summer
<i>Corydalis flavula</i>	yellow fumewort	T	early spring
<i>Euphorbia commutata</i>	tinted spurge	T	mid – late-spring
<i>Galearis spectabilis</i>	showy orchis	T	mid-spring – early summer
<i>Morus rubra</i>	red mulberry	T	mid-spring – mid-autumn
<i>Oxalis violacea</i>	violet wood sorrel	X	mid-spring – early summer
<i>Polemonium reptans</i>	Jacob's ladder	T	mid-spring – early summer
<i>Trillium recurvatum</i>	prairie trillium	T	early spring – early summer
<i>Trillium sessile</i>	toadshade	T	early spring – early summer
*T: state threatened; SC: state special concern; X: state extirpated.			

The entire survey area was walked in a grid pattern by three MNFI botanists during the May 24 survey. The search area consisted of surveying 200' north and 300' south of the culvert outlets on both sides of M-139; surveying the side slopes from the edge of the road down to the culvert ends at the bottom of the slope; and surveying 100' outward from the culvert ends on both sides of M-139 (Fig. 4). This area was broadly re-surveyed on foot by Julie McLaughlin on July 18.



Figure 4. Map of survey area in red, with culvert in yellow.

Rare species occurrences were mapped as GPS points or polygons and associated data were gathered using Survey 123, including the species, location, and number of plants. These data were provided to MDOT. Other data gathered included habitat, associated species, and condition of the plants. These data will be uploaded into the Michigan Natural Heritage Database.

Throughout the survey area, surveyors also noted the presence and identification of occurrences of high-impact

invasive species. These data were captured using the Midwest Invasive Species Information Network (MISIN) phone app to contribute to the statewide map of invasive species throughout the Midwest, and to inform MDOT for potential management.

Results and Discussion

Rare Plant Species Observations

State threatened prairie trillium and toadshade (*Trillium sessile*) were documented on the west side of M-139/Front St. (Fig. 5). A portion of the population was mapped as a polygon using ESRI Field Maps due to the high number and even distribution of plants over a large area. No other rare species were detected.

This area is best described as a mesic southern forest and floodplain forest complex (Fig. 6). The canopy is dominated by native sugar maple (*Acer saccharum*), sycamore (*Platanus occidentalis*), paw-paw (*Asimina triloba*), and green ash (*Fraxinus pennsylvanica*); vines and shrubs include Virginia creeper (*Parthenocissus quinquefolia*), elderberry (*Sambucus canadensis*), poison-ivy (*Toxicodendron radicans*), Oriental bittersweet (*Celastrus occidentalis*), and Amur honeysuckle (*Lonicera maackii*).

The herbaceous layer is diverse with many native species including may-apple (*Podophyllum peltatum*), swamp buttercup (*Ranunculus hispidus*), enchanter's night-shade (*Circaea canadensis*), annual bedstraw (*Galium aparine*), nodding smartweed (*Persicaria lapathifolia*), and James' sedge (*Carex jamesii*); however, garlic mustard, dame's rocket (*Hesperis matronalis*), and periwinkle (*Vinca minor*) are well established.



Figure 5. Map showing the locations of prairie trillium (*Trillium recurvatum*), and toadshade (*T. sessile*) found during 2022 surveys.



Figure 6. Mesic southern forest/floodplain forest complex with prairie trillium (*Trillium recurvatum*) and toadshade (*T. sessile*).

Quantity and Health of Prairie Trillium and Toadshade

The populations of prairie trillium and toadshade are large and fairly healthy. Surveyors counted 682 individual stems of prairie trillium (614 flowering; Fig. 7), and 246 stems of toadshade (203 flowering; Fig. 8). The majority of plants were noted as having “fair” or “good” vigor.



Figure 7. Prairie trillium (*Trillium recurvatum*) in flower. Note the petioles on the leaves.



Figure 8. Toadshade (*Trillium sessile*) plants in flower. Note the sessile leaves.

Threats and mitigation measures

Areas where trillium plants were found are primarily in poor condition due to invasive plants, including aggressive non-native honeysuckles (*Lonicera* spp.), Oriental bittersweet, and multiflora rose (*Rosa multiflora*), and significant amounts of periwinkle, dame's rocket, and garlic mustard (*Alliaria petiolata*). Invasive species control is essential if the trillium populations are to be preserved at this site. There is also evidence of deer browse in these areas, which is a serious threat to trillium species (MNFI 2022).

The project area is adjacent to a private residence and driveway, as well as old access roads, which not only remove and fragment habitat, but also provide pathways that facilitate the spread of invasive species (Treher 2019).

As construction is expected to include the use of large machinery, care must be taken to keep the canopy intact in this area to maintain appropriate habitat requirements for these trilliums, which do not do well under increased light conditions (MNFI 2022). Mitigation measures should

be taken prior to site disturbance and when staging equipment on the ground. Disturbance in a closed-canopy forest is known to facilitate the spread of invasive plant species.

If impacts to the trilliums are unavoidable, transplantation to a suitable site is recommended. Both trillium species are found in forested floodplains and mesic forests southwestern Lower Michigan – especially moist ravines, rich moist woods and bluffs – and are most frequent on limestone-derived soils (O'Connor, R.P. 2007). Efforts should be made to find a transplant site with these conditions and where likelihood of survival is high.

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