Rare Plant Species Surveys for the Michigan Department of Transportation: M-139 Deans Hill Rd, Berrien County.

MDOT Project No. 214936





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Cover: Clockwise from top left: State threatened prairie trillium (*Trillium recurvatum*) in the woods adjacent to Lemon Creek; Mature elm, maple and beech trees adjacent to Lemon Creek; Ohio buckeye saplings adjacent to Lemon Creek.

All photos in this report, unless otherwise stated in captions, were taken by Julie McLaughlin.

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Abstract

MDOT Project 214936 was surveyed for rare plant species and suitable habitat in summer 2022 to assess potential impacts of road improvement projects. M-139 between Hinchman and Deans Hill Road was surveyed by vehicle and three sections were then surveyed on foot based on potentially suitable habitat. A small population of the state listed prairie trillium (*Trillium recurvatum*) was located in the second section, adjacent to Lemon Creek. This population is threatened both by construction impacts and a dense infestation of multiple invasive species. Ensuring that this location is not disturbed during road work and that invasive species are addressed will be required to sustain this population. If this is not feasible, transplantation to a suitable site elsewhere is recommended.

Introduction and Methods

Surveys for rare plant species are required for this project to ensure compliance with regulations regarding potential impacts of road improvement projects on rare species. The project area is in Berrien County and span M-139 from 55 feet south of Deans Hill Road to 475 feet south of Hinchman Road (Fig. 1). Road construction will include hot mix asphalt overlay, sidewalks, ADA ramp upgrades and possible slope work, culverts, ditching and grading.



Figure 1. Overview map of MDOT project area 214936 in red. The project area is located along *M*-139 from 55 feet south of Deans Hill Road to 475 feet south of Hinchman Road, Berrien County.

A search of the Michigan Natural Heritage Database was performed to identify rare plant species records that have been previously documented within a two-mile buffer of the project area (Table 1). Twenty-one rare plant species have been previously documented within two miles of the project area. Of these species, one is listed as state extirpated, 16 are state threatened, and four are listed as special concern. Surveys targeted these species, however, any suitable habitat for rare species was surveyed in case additional species occur in the project area that have not yet been documented.

The majority (18) of these species are found in wet and forested habitats such as mesic southern forest, southern hardwood swamp, and floodplain forest. Suitable habitat for the remainder of the listed species was not documented. As such, the extant community types were the targets for foot surveys and were identified primarily through both aerial photo interpretation and visual encounters in the field.

| Latin name | Common name | State status* | Target season | | |
|---|--------------------------|---------------|-----------------------------|--|--|
| Asplenium rhizophyllum | walking fern | Т | mid-spring - late autumn | | |
| Berula erecta | cut-leaved water parsnip | Т | early - late summer | | |
| Camassia scilloides | wild hyacinth | Т | mid-spring – early summer | | |
| Carex trichocarpa | hairy-fruited sedge | SC | mid-spring – early summer | | |
| Collinsia verna | blue-eyed Mary | SC | mid-spring – early summer | | |
| Conioselinum chinense | hemlock-parsley | Т | late summer – mid-autumn | | |
| Corydalis flavula | yellow fumewort | Т | early spring | | |
| Cypripedium candidum | white lady-slipper | Т | mid-spring – early summer | | |
| Dryopteris celsa | small log fern | Т | early summer – mid-autumn | | |
| Endodeca serpentaria | Virginia snakeroot | Т | mid – late summer | | |
| Euphorbia commutata | tinted spurge | Т | mid- to late spring | | |
| Fraxinus profunda | pumpkin ash | Т | late summer | | |
| Galearis spectabilis | showy orchis | Т | mid-spring – early summer | | |
| Hieracium paniculatum | panicled hawkweed | Т | late summer – early autumn | | |
| Jeffersonia diphylla | twinleaf | SC | mid-spring | | |
| Morus rubra | red mulberry | Т | mid-spring – mid-autumn | | |
| Oxalis violacea | violet wood sorrel | Х | mid-spring – early summer | | |
| Panax quinquefolius | ginseng | Т | early summer – mid-autumn | | |
| Polemonium reptans | Jacob's ladder | Т | mid-spring – early summer | | |
| Trillium recurvatum | prairie trillium | Т | early spring – early summer | | |
| Trillium sessile | toadshade | Т | early spring – early summer | | |
| *T = threatened; SC = special concern; X = extirpated | | | | | |

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

Three surveys were conducted during the 2022 growing season and corresponded as closely as possible to early, mid, and late-season phenology to maximize the chances of detecting target species. The early survey was conducted on June 2-3, the mid-season survey on July 18, and the late season survey on August 30.

The entire corridor was briefly surveyed from a vehicle during the early visit, and areas with potential habitat were then visited on foot. Much of the corridor falls within urban and developed areas that are mowed and maintained throughout the year and do not have suitable habitat for rare species. Walking surveys were concentrated in three areas (Fig. 2), two of which had potential habitat for rare plants. These two areas were surveyed twice more in mid- and late-season. In addition to searching for rare species, surveyors noted the presence and identification of non-native invasive species, high-quality habitats, and other notable features.



Figure 2. Map of the project area showing the locations of three important survey sections.

Results

Descriptions of plant communities by survey section

The vegetation and habitat characteristics found in this project area are summarized in the following sections. A description of the habitat, as well a list of common and/or noteworthy plant species encountered is presented for each section.

Suitable habitat for rare plant species was found in survey sections 2 and 3 (Fig. 2). Section 2 contains southern hardwood swamp/mesic southern forest habitat adjacent to Lemon Creek where prairie trillium was found. Section 3 contains small, degraded southern hardwood swamp and wet meadow areas that were not found to contain rare plant species.

A group of species that form a community that is commonly encountered throughout this project area in dry, mowed rights-of-way is presented in Table 2. These species are referred to as "roadside weeds" and are referenced as such throughout the rest of this report.

Table 2. Plant species frequently encountered along dry, mowed roadsides.

| Latin name | Common name | Origin | Habit |
|---------------------------|------------------------|------------|-------|
| Achillea millefolium | yarrow | native | forb |
| Agrostis gigantea | redtop | non-native | grass |
| Ambrosia artemisiifolia | common ragweed | native | forb |
| Asclepias syriaca | common milkweed | native | forb |
| Asclepias verticillata | whorled milkweed | native | forb |
| Bromus inermis | smooth brome | non-native | grass |
| Centaurea stoebe | spotted knapweed | non-native | forb |
| Cichorium intybus | chicory | non-native | forb |
| Cirsium arvense | Canada thistle | non-native | forb |
| Conium maculatum | poison hemlock | non-native | forb |
| Dactylis glomerata | orchard grass | non-native | grass |
| Daucus carota | Queen Anne's lace | non-native | forb |
| Dipsacus fullonum | wild teasel | non-native | forb |
| Dipsacus laciniatus | cut-leaf teasel | non-native | forb |
| Elymus repens | quack grass | non-native | grass |
| Erechtites hieraciifolius | fireweed | native | forb |
| Erigeron philadelphicus | common fleabane | native | forb |
| Euthamia graminifolia | grass-leaved goldenrod | native | forb |
| Hypericum perforatum | St. John's-wort | non-native | forb |
| Leucanthemum vulgare | ox-eye daisy | non-native | forb |
| Medicago lupulina | black medic | non-native | forb |
| Melilotus albus | white sweet-clover | non-native | forb |
| Phleum pratense | Timothy | non-native | grass |
| Plantago lanceolata | narrow-leaved plantain | non-native | forb |
| Plantago major | common plantain | non-native | forb |
| Plantago rugelii | red-stalked plantain | native | forb |
| Poa pratensis | Kentucky bluegrass | non-native | grass |
| Securigera varia | crown vetch | non-native | vine |
| <i>Setaria</i> spp. | foxtail | non-native | grass |
| Solanum carolinense | horse-nettle | non-native | forb |
| Solidago canadensis | Canada goldenrod | native | forb |
| Torilis japonica | hedge-parsley | non-native | forb |
| Toxicodendron radicans | poison-ivy | native | vine |
| Tragopogon dubius | goat's beard | non-native | forb |
| Trifolium pratense | red clover | non-native | forb |
| Trifolium repens | white clover | non-native | forb |
| Verbascum thapsus | mullein | non-native | forb |
| Vitis riparia | river-bank grape | native | vine |

Section 1: M-139 from E. Hinchman Road south to Campbell Drive



The northernmost survey area is the entire M-139 rightof-way between Hinchman Road and Campbell Drive. The majority of this right-ofway is mowed or developed. The entire length of this section was surveyed by vehicle, with foot surveys conducted in unmowed areas, unmowed ditches, and anywhere with intact forest, to check for potential rare woodland species.

Figure 3. Map of Section 1, with survey area in yellow.

Mowed areas adjacent to the road and under utility rights-of-way consist predominantly of roadside weeds (Table 2; Fig. 4).

Seasonally wet and un-mowed ditches were dry during the spring survey, and contained staghorn sumac (*Rhus typhina*), willow (*Salix* spp.), cottonwood (*Populus deltoides*), sedges (*Carex* spp.), as well as invasive species like



Figure 4. Roadside weeds typical of mowed areas, M-139.

(*Elaeagnus umbellata*), orange day lily (*Hemerocallis fulva*), asparagus (*Asparagus officinalis*), cat-tails (*Typha* spp.), non-native phragmites (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and poison-hemlock (*Conium maculatum*).



Figure 5. Vegetation typical of un-mowed ditches within right-of-way.

The majority of the forested areas in this section are located outside of the survey zone; however, in several areas the forest edges extend into the right-of-way, primarily on the east side of the road (Fig. 6). No suitable habitat for rare plant species was observed during foot surveys. These edges contain a mix of native and invasive trees and shrubs, including black cherry (*Prunus serotina*), sugar maple (*Acer saccharum*), boxelder (*Acer negundo*), black walnut (*Juglans nigra*), honey locust (*Gleditsia triacanthos*), Siberian elm (*Ulmus pumila*), multiflora rose (*Rosa multiflora*), European highbush-cranberry (*Viburnum opulus*),

honeysuckle (*Lonicera* spp.), and Virginia creeper (*Parthenocissus quinquefolia*). With the exception of dame's rocket (*Hesperis matronalis*), there is little to no herbaceous layer.

Several less common non-native species were documented in small areas on the east side of the road: butterweed (*Packera glabella*), cat's ear (*Hypochaeris radicata*), and common comfrey (*Symphytum officinale*).

One small section of forest contains mostly native species and thus was surveyed thoroughly (Fig. 3). Canopy species included American elm (*Ulmus americana*), hickory (Carya spp.), black cherry ash (Fraxinus spp.), paw (Asimina triloba), spicebush (Lindera *benzoin*), Jack-in-the-pulpit (Arisaema triphyllum), and Christmas fern (Polystichum acrostichoides). The Invasive Japanese barberry (Berberis *thunbergii*) is also found in this section of woods.



Figure 6. Vegetation typical of forested edges within rightof-way.



Section 2: M-139 Between Valley View and University Blvd.

Figure 7. Map of Section 2, with survey area in yellow.

This section contains Lemon Creek and its forested floodplains (Fig. 7). Both sides of the road are heavily disturbed with large cement, metal, and plastic culverts, and rip-rap (Fig. 8). In addition, many invasive species are well established (Fig. 9).



Figure 8. Culvert and rip-rap on south side of M-139.



Figure 9. Left: culvert north of M-139. Right: culvert, pipe, rip-rap, and silt fence on south side of M-139.

Forest to the north of M-139/Old US-31 in Section 2

Despite being heavily degraded and dominated by invasive groundcover and shrubs, the area north of M-139 contains a small population of prairie trillium (Fig. 10). This was discovered just southeast of Lemon Creek, during the early season visit by Julie McLaughlin.



Figure 10. Map showing the locations where prairie trillium (Trillium recurvatum) was found just south of Lemon Creek in Section 2.



Figure 11. Prairie trillium (Trillium recurvatum) and surrounding trees.

The habitat here is best described as a degraded mesic southern forest and southern hardwood swamp complex, with sugar maple, beech (*Fagus americana*), American elm (*Ulmus americana*), boxelder, sycamore (*Platanus occidentalis*), and hackberry (*Celtis occidentalis*). Shrubs include buckeye (*Aesculus glabra*), green ash (*Fraxinus pennsylvanica*), and non-native species. The herbaceous layer includes wood-sage (*Teucrium canadense*), wing-stem (*Verbesina alternifolia*), jumpseed (*Persicaria virginiana*), bottlebrush grass (*Elymus hystrix*), Virginia wild-rye (*Elymus virginicus*), and various sedges (*Carex* spp).

This habitat has been heavily invaded by invasive species including creeping euonymus (*Euonymus fortunei*), English ivy (*Hedera helix*), multiflora rose, garlic mustard (*Alliaria petiolata*), celandine poppy (*Chelidonium majus*), dame's rocket, honeysuckle (*Lonicera tatarica*), and Japanese barberry.

Status of prairie trillium

Habitat description

Prairie trillium prefers rich woodlands with limestone-derived soils and can be found in the following habitat types: floodplain forests, moist ravines, and mesic forests (O'Connor 2007).

Quantity and health of population

The population of prairie trillium is quite small, only 13 plants, and only one plant was flowering at the time of the survey, indicating poor vigor. The plants appeared stressed due to their yellowing appearance (Fig. 12).

Threats and mitigation measures

Invasive species dominate the area where prairie trillium was found, including creeping euonymus (*Euonymus fortunei*; Fig. 13), English ivy (*Hedera helix*), multiflora rose, garlic



Figure 12. Stressed individuals of prairie trillium (Trillium recurvatum) at the base of an elm.



Figure 13. Areas of forest invaded by creeping euonymus (Euonymus fortunei).

mustard (*Alliaria petiolata*), celandine poppy (*Chelidonium majus*), dame's rocket, honeysuckle (*Lonicera tataric*a), and Japanese barberry.

Section 3: M-139/Ferry Road between Bluff and Deans Hill Road.

This section spans M-139/Ferry Road right-of-way from Bluff to Deans Hill Road (Fig. 14). The entire section was surveyed by vehicle during the initial visit, and two portions were surveyed on foot.

The portion southwest of the St. Joseph River (Fig. 14) was surveyed on foot and consists mostly of roadside weeds (Fig. 15) and degraded mesic southern forest habitat with invasives such as honeysuckles (*Lonicera* spp.), orange day-lily, and periwinkle (*Vinca minor*). One small, forested area on the north side of Ferry Road contained some native species such as large white oak (*Quercus alba*), red oak (*Q. rubra*), black maple (*Acer nigrum*), hackberry (*Celtis occidentalis*), redbud (*Cercis canadensis*), and boxelder. No rare plant species were found.



Figure 14. Map of Section 3, with survey areas in yellow.

The second section surveyed on foot is near Deans Hill Road that is part of Fisherman's Haven Nature Preserve (Fig. 14). It contains a very small degraded southern hardwood swamp and wet meadow areas (Fig. 16).



Figure 15. Roadside weeds along Ferry Rd.

The hardwood swamp has a small stream and contains red maple, basswood (*Tilia americana*), hackberry (*Celtis occidentalis*) red oak (*Quercus rubra*), and black cherry. Shrubs include American highbush-cranberry (*Viburnum trilobum*), wild grape (*Vitis riparia*), spicebush, black currant (*Ribes Americanum*), and understory species include bloodroot



Figure 16. Degraded wet meadow at Fisherman's Haven Preserve.

(*Sanguinaria canadensis*), skunk cabbage (*Symplocarpus foetidus*), starry false Solomon seal (*Maianthemum stellatum*), Jack-in-the-pulpit. Primary invasive species are honeysuckles (*Lonicera maackii* and *L. tatarica*).

The wet meadow includes willows (*Salix* spp.), American highbush-cranberry (*Viburnum trilobum*), red-osier dogwood (*Cornus sericea*), wild grape (*Vitis riparia*), lizard's tail (*Saururus cernuus*), Joe-Pye weed (*Eutrochium maculatum*), boneset (*Eupatorium perfoliatum*), sedge (*Carex hystericina*), and invasive multiflora rose, purple loosestrife, non-native cat-tails, and phragmites (Fig. 16).

The right-of-way south of Ferry Road adjacent to the St. Joseph River is primarily a monoculture of large tree-of-heaven (*Ailanthus altissima*).

Discussion

The highest quality areas in the project area are the floodplain forests and mesic southern forests within Section 3. Care should be taken to limit the disturbance throughout this section of the survey area, so that current habitat and native species components are maintained. No rare species were found here. Aside from these forested areas, the right-of-way in Section 3 is highly infested with invasive species, especially shrubs and roadside weeds. Emphasis should be placed on decontamination of vehicles when moving to un-infested sites.

Despite the lower-quality habitat, a small population of state threatened prairie trillium was located within Section 2. Transplantation to a suitable site elsewhere or ensuring that this location is not disturbed during road work and treatment of invasive species is recommended. It is critical for the continued existence of this small population that invasive species be managed and for individual plants to be protected during construction.

In addition, maintenance of the mature canopy is essential, and the large beech, maple, elm, and hackberry trees should be protected.

References

O'Connor, R.P. 2007. Special Plant Abstract for *Trillium recurvatum* (prairie trillium). Michigan Natural Features Inventory. Lansing, MI. 3 pp. <u>https://mnfi.anr.msu.edu/abstracts/botany/Trillium_recurvatum.pdf</u>. [Accessed November 2022].

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