

Rare Plant Surveys for the Michigan Department of Transportation: I-94 Portage Creek. Project #210812, Kalamazoo County



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Cover: State Extirpated nut sedge (*Cyperus acuminatus*). Photo by Amanda K. Klain.

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Abstract

Foot surveys for rare plant species were conducted in portions of the (ROW) rights-of-way along the east side of US-131 and the north side of I-94 in Kalamazoo County which is proposed for road-widening. The surveys revealed three main habitats: open grassland dominated by non-native grasses, forested edges composed of native canopy tree species with a mixture of native and non-native ground cover, and mown areas unsuitable for any of the target species.

None of the target species for this project were found within the project perimeters, however the Special Concern target species side oats grama grass (*Bouteloua curtipendula*) was found just outside of the northern extent of the project area. Also, a formerly State Extirpated nut grass (*Cyperus acuminatus*) was unexpectedly found growing along the I-94 ROW in a wet ditch. Hydrological and other disturbances should be avoided in the vicinity of this occurrence.

Introduction

This report is a summary of rare plant surveys conducted along portions of I-94 and US-131 in Kalamazoo County. Project #210812 is in the vicinity of Portage Creek starting 0.2 miles south of the I-94 and US-131 interchange and north along the on US-131 northbound lane only for approximately two miles. It includes all northeast and southeast interchange ramps and loops, and an approximately one-mile segment eastward along westbound I-94 from the mid-point of the interchange. In addition, it includes a 500 ft segment beyond the termini of both US-131 and I-94 (Figure 1).

Surveys are required prior to reconstruction and rehabilitation of these portions of the highway to ensure regulatory compliance for the state and federal endangered species acts. This project consists of road widening for an additional ramp lane at the I-94 west bound ramp at US-131.

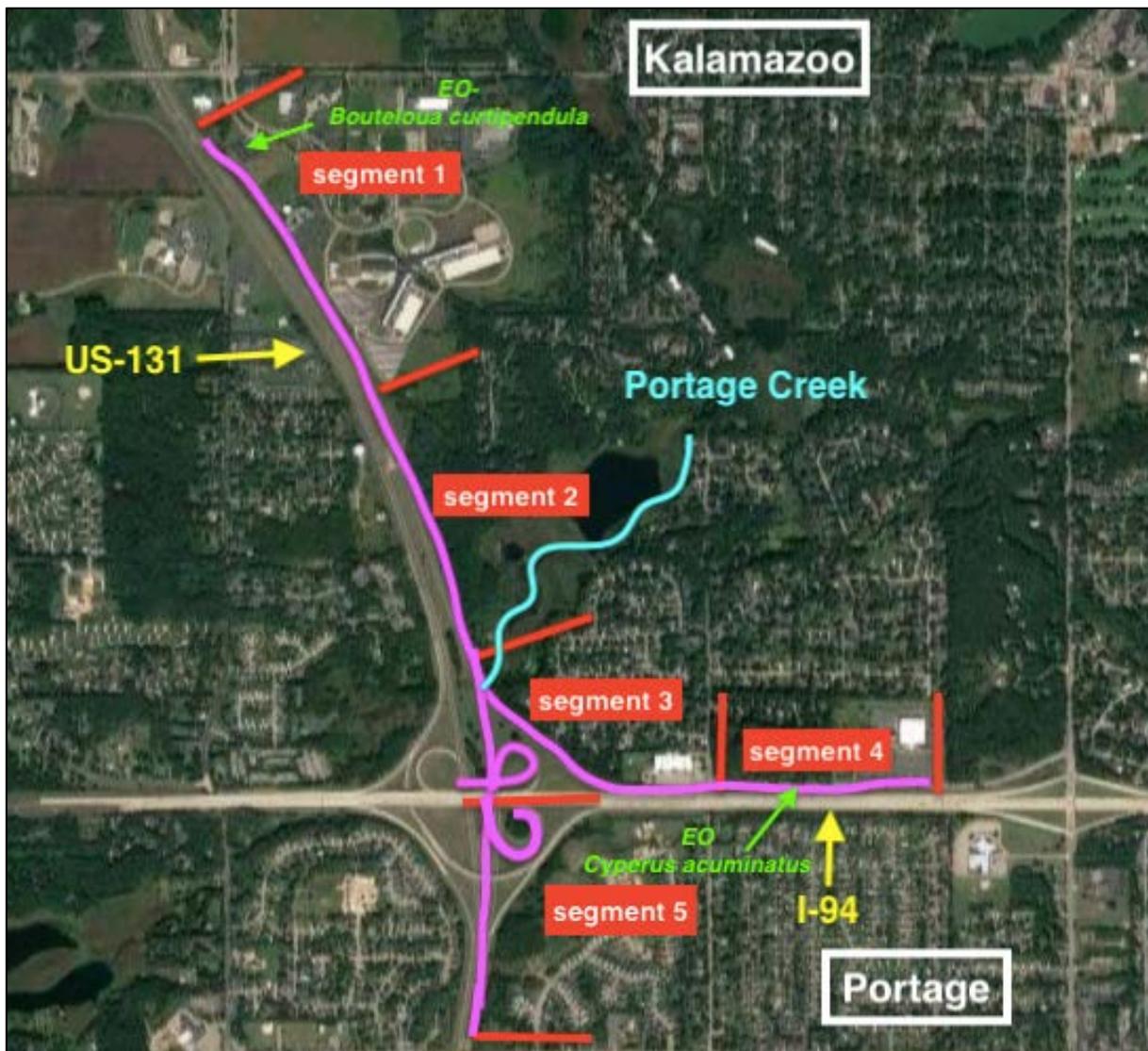


Figure 1. Project location on I-94 and US-131 in Kalamazoo County, Michigan.

Methods

A review of the Michigan Natural Heritage database was conducted to identify species listed as Threatened (T), Endangered (E), or Special Concern (SC)¹ that have been previously documented within a 2-mile radius of the project area as shown in purple in Figure 1.

Eleven species were identified as targets and surveys were conducted to coincide with the optimal detection windows for these species (Table 1, 2). Mid-season surveys were conducted on July 7, 2021, and focused on the species shown in Table 1. Late-season surveys were conducted on August 26, 2021, and focused on the species in Table 2. A third survey was conducted on October 5th as a follow-up to the discovery of state extirpated nut grass (*Cyperus acuminatus*) during the August 26th visit.

Table 1. Mid-season survey targets, their status, and optimal survey windows.

Scientific Name	Common Name	Listing Status	Best Survey Period
<i>Angelica venenosa</i>	hairy angelica	Special Concern	July-Sept.
<i>Berula erecta</i>	cut-leaved water- parsnip	Threatened	June-August
<i>Bouteloua curtipendula</i>	side-oats grama grass	Endangered	August-October
<i>Dichanthelium leibergii</i>	Leiberg's panic grass	Threatened	June-August
<i>Silene stellata</i>	starry campion	Threatened	July-August

Table 2. Late-season survey targets, their status, and optimal survey windows.

<i>Arnoglossum plantagineum</i>	prairie Indian plantain	Special Concern	June-late Oct.
<i>Eryngium yuccifolium</i>	rattlesnake master	Threatened	July-September
<i>Silphium integrifolium</i>	rosinweed	Threatened	July-September
<i>Spiranthes ovalis</i>	lesser ladies'-tresses	Threatened	Sept-early Nov.
<i>Zizania aquatica</i>	Southern wild rice	Threatened	July-3 rd week September

The project area was divided into five segments and foot surveys were conducted by meander survey throughout all segments. Surveys focused on suitable habitat for the target species, however, the surveyor aimed to survey all microhabitats and note all species along the corridor in case other rarities or new county records could be present, but not yet documented. General habitat conditions, dominant plant species, and populations of rare and notable invasive plants in five segments of the project area were recorded. Notable invasive plants include all non-native, invasive plants for which management by MDOT can likely make a significant impact by containing their spread along the I-94 corridor. When rare plant occurrences and notable invasive species populations were found, they were marked with GPS points using an Android phone and a Samsung tablet. Associated data for rare plant occurrences were entered into Survey 123 for upload to the MNFI natural heritage database, Biotics.

¹Threatened 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.

Erring on the side of caution and acting with due diligence, the whole project corridor was walked during all three visits, based on the unexpected discovery of *Cyperus acuminatus* in what appeared to be marginal habitat. This species was previously listed as extirpated in the state.

Results

Overview

The right-of-way from road to fence ranged from 50 feet to 140 feet wide, and is mostly non-forested, densely vegetated, and dominated by non-native grass species with a mix of native and non-native herbaceous forbs. Most of the cloverleaf and off-ramps are mowed. There are some areas of disturbed mesic forest and forest edges with both native and non-native species, and many invasive species. No suitable habitat for prairie Indian-plantain (*Arnoglossum plantagineum*), cut-leaved water-parsnip (*Berula erecta*), rattlesnake master (*Eryngium yuccifolium*), and wild rice (*Zizania aquatica*) were found during the first survey and the late survey focused on the other targets.

None of the target species were found within the project area, however side-oats grama grass was observed just outside the project area on US-131, adjacent to a business parking lot at the north extent of the project. It is suspected that this occurrence is the result of a planted seed mix, based on the location, associated species, and surrounding habitat. A thorough investigation within the right-of-way close to this occurrence was conducted and no individuals were found within the survey perimeters. The former state extirpated nut grass (*Cyperus acuminatus*-now state threatened) was found in segment 4 growing along the I-94 right-of-way in a wet ditch. At the time of the discovery the identification was unknown, and a sample of the plant was taken and confirmed by Tony Reznicek, Curator Emeritus, Vascular Plants, University of Michigan Herbarium. He later accompanied the surveyor on a site visit to see the nut-grass and documented perennial fox tail, a non-native grass new to the state.

Brief summaries of the vegetation of each section are included below.

Descriptions of Segments

Segment 1: Northern extent of project area, including the 500 ft buffer, along US-131 to Western Michigan University.

This segment is a mostly an open grassland community dominated by non-native grasses including smooth brome grass (*Bromus inermis*), fescues (*Festuca spp.*, *Lolium arundinacea*), reed canary grass (*Phalaris arundinacea*), Kentucky bluegrass (*Poa pratensis*), and others (Fig. 2). A mix of non-native forbs including spotted knapweed (*Centaurea stoebe*), Canada and bull thistle (*Cirsium arvense*, *C. vulgare*), white campion (*Silene latifolia*), mullein (*Verbascum thapsus*), and native forbs including yarrow (*Achillea millefolium*), common milkweed (*Asclepias syriaca*), grass-leaved goldenrod (*Euthamia graminifolia*), and goldenrods (*Solidago altissima* and *S. canadensis*) were interspersed. There were two isolated three-foot-tall saplings of tree-of-heaven (*Ailanthus altissima*) near the fence line. A memorial for Phillip Edward was found in the southern half of Segment 1 in the grassy open ROW. Although this segment is not of high ecological quality, it is stable and densely vegetated.



Figure 2. Open grassland community in Segment 1.



Figure 3. Monarch on butterfly milkweed (*Asclepias tuberosa*) in Segment 2.

Segment 2: US-131 from Western Michigan University to the north portion of the I-94 clover-leaf interchange

This segment has similar vegetation to that of Segment 1, with some additional scattered native species including butterfly weed (*A. tuberosa*; Fig. 3) and whorled milkweed (*A. verticillata*, (Fig.

4). These are most prevalent where the right-of-way slopes down to Portage Creek. There are disturbed woodland edges near the fence line with mature pignut hickory (*Carya ovata*), black cherry (*Prunus serotina*), red oak (*Quercus rubra*) and may-apple (*Podophyllum peltatum*; Fig. 5). The understory and ground later have a preponderance of invasive species including tree-of-heaven (*Ailanthus altissima*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese honeysuckle (*Lonicera japonica*), scattered groves of saplings and mature black locust (*Robinia pseudo-acacia*), multiflora rose (*Rosa multiflora*), black swallow-wort (*Vincetoxicum nigrum*), and crown-vetch (*Securigera varia*).



Figure 4. Whorled milkweed in Segment 2.



Figure 5. Woodland edge with may-apple in Segment 2.

Segment 3: The I-94 and US-131 interchange, including the northeastern cloverleaf and associated ramps.

This segment contains the area where Portage Creek runs under the interstate just north of the interchange. There is a steep slope down to the culvert with an especially disturbed and degraded habitat woodland edge, containing many non-native invasive species, downed trees, garbage, and thickets of vegetation. Tree-of-heaven is abundant here, with seedlings and saplings throughout (Fig. 6). The invasive shrubs noted in Segment 2 are also present along with abundant garlic mustard (*Alliaria petiolata*) and dames rocket (*Hesperis matronalis*). A native canopy persists including black walnut (*Juglans nigra*), red oak, black cherry, and pignut hickory.

The rest of this segment includes the cloverleaves and interchange which is mostly mowed, with a mix of species including native daisy fleabane (*Erigeron strigosus*) and purple love grass (*Eragrostis spectabilis*), and non-native spotted knapweed (*Centaurea stoebe*) and narrow-leaved plantain (*Plantago lanceolata*). Within the cloverleaf there is an isolated grove of bur oaks (*Q. macrocarpa*) that is infested with Oriental bittersweet (*Celastrus orbiculatus*). There is also a small isolated wet swale with non-native Callery pear (*Pyrus calleryana*) and narrow-leaved cat-tail, as well as native fox and round-headed sedge (*Carex vulpinoidea*, *C. cephalophora*). There is an unmarked memorial along the west side of the US-131 on-ramp amongst some planted hawthorn trees.



Figure 6. Tree-of-heaven seedlings and saplings along slop in Segment 3.

Segment 4: I-94 from US-131 to the eastern extent of the project area, with 500 ft buffer.

The extirpated nut grass was unexpectedly found in a wet ditch in the middle of the ROW in this segment. It was limited to open wet areas where there was little competition (Fig. 7). The last and only other reported observation of this species in Michigan was in 1928, at Union Lake in Oakland County. Other plants found in the more vegetated parts of the wet ditch zone include



Figure 7. Wet ditch along I-94 with *Cyperus acuminatus*.

native umbrella sedge (*Cyperus odoratus*), and invasive narrow-leaved cat-tail, and cocklebur (*Xanthium strumarium*). The rest of the area is drier and generally dominated by western ragweed (*Ambrosia psilostachya*; Fig. 7) and a mix of interesting grasses including native purple top (*Tridens flava*), hairy lens grass (*Paspalum setaceum*, non-native perennial foxtail (*Setaria parviflora*; new to Michigan), prairie cupgrass (*Eriochloa contracta*), scratchgrass (*Muhlenbergia asperifolia*), buffalo grass (*Bouteloua dactyloides*), windmill grass (*Chloris verticillata*), smooth crab grass (*Digitaria ischaemum*), and salt meadow grass (*Diplachne fusca*). Garlic mustard is growing along the fence line close to the project's east extent.



Figure 8. Open community with western ragweed along west-bound I-94 in Segment 4.

Segment 5: Southern extent of project including the cloverleaf and 500-ft buffer.

The cloverleaf contains a 1.6-acre patch of dry-mesic forest that is surrounded by mowed grass (Figs. 9, 10). Dominant species in the woodland are black walnut (*Juglans nigra*), red oak, pignut hickory, Solomon-seal (*Polygonatum biflorum*), false spikenard (*Maianthemum racemosum*), and waist-high poison ivy (*Toxicodendron radicans*) throughout. The rest of this

segment is similar in habitat and species to Segment 1 with several additional species including stinging nettle (*Urtica dioica*) and non-native wild four o'clock (*Mirabilis nyctaginea*).



Figure 9. Cloverleaf with isolated patch of dry-mesic forest in Segment 5.



Figure 10. Understory of dry-mesic forest in cloverleaf in Segment 5.

Discussion

The open, grassland habitat on both the north and south ends of US-131 is vulnerable to disturbance from road construction which may facilitate the spread of nearby invasive species such as tree-of-heaven, honeysuckles, buckthorn, and black locust into these areas. However, since the interchange is regularly mowed, negative impacts of the road construction are likely to be minor. Based on the open, moist conditions required by the rare nut grass, this species may benefit from minor disturbance. Since the occurrence is limited to areas free of competing vegetation, the construction could potentially create habitat for it to spread. Disturbance of the hydrology in the vicinity should be avoided as it is undoubtedly key to the nut sedge's emergence and persistence.

Acknowledgements

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