Rare Plant Surveys for the Michigan Department of Transportation, US Hwy-23 Flex Route Extension, 8-mile Road to I-96, Livingston County, Michigan.

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Cover: US Highway 23-mile marker sign. Photo by Brian Klatt

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Abstract

Foot surveys for rare species were conducted in the un-mowed rights-of-way of US Highway 23 in the proposed for flex lane expansion area between 8-mile Road and its junction with Grand River/Interstate 96 in Livingston County, Michigan. The surveys revealed that the rights-of-way are dominated by old-field (early successional) plant communities and include many non-native invasive species. Also, at least two potential bat roost trees were noted. None of the eighteen targeted rare species were found in the project area. Restrictions due to the Covid-19 crisis prevented surveys for two of the species during their optimal survey times. However, no suitable habitat for these species were found in the project area and their presence is considered highly unlikely.

Introduction

To assist the Michigan Department of Transportation (MDOT) in meeting state and Federal environmental review requirements, the Michigan Natural Features Inventory (MNFI) conducted field surveys for rare species and areas of high conservation value in areas of the proposed expansion of flex lanes on US Highway 23 (US-23) in Livingston County, Michigan. The focus of the surveys was rare species known to occur in the area based on a search of the Natural Heritage Database (NHD) maintained by MNFI. The NHD is the most comprehensive database on the location and condition of threatened, endangered, and other rare species in the State of Michigan, as well as high-quality natural communities. This database has been compiled by professional biologists over the past 40 years under the Natural Heritage Methodology (NatureServe 2020) and is used by State and Federal regulators within Michigan, as well as by conservation organizations, businesses, and the public.

Methods

The areas surveyed included approximately 6.5 miles of US-23 from the 8-mile Road interchange at Whitmore Lake north to the intersection of US-23 and Grand River/Interstate Highway 96 (I-96) in Livingston County (Figure 1). Searches consisted of meander surveys on foot along the un-mowed rights-of-way (ROW) on both sides of the highway, constituting approximately 13 miles of linear ROW. Additionally, the interchange loops and areas between ramps were also surveyed.

Target species were determined by a search of the NHD for known occurrences of species included on the State and Federal lists of threatened and endangered species. Though not

protected legally, “Special Concern” species were also considered target species. Special Concern species are those, though not on the lists of threatened and endangered species, that are designated by MNFI to be vulnerable and could become threatened or endangered, or for which insufficient information as to their abundance exists.

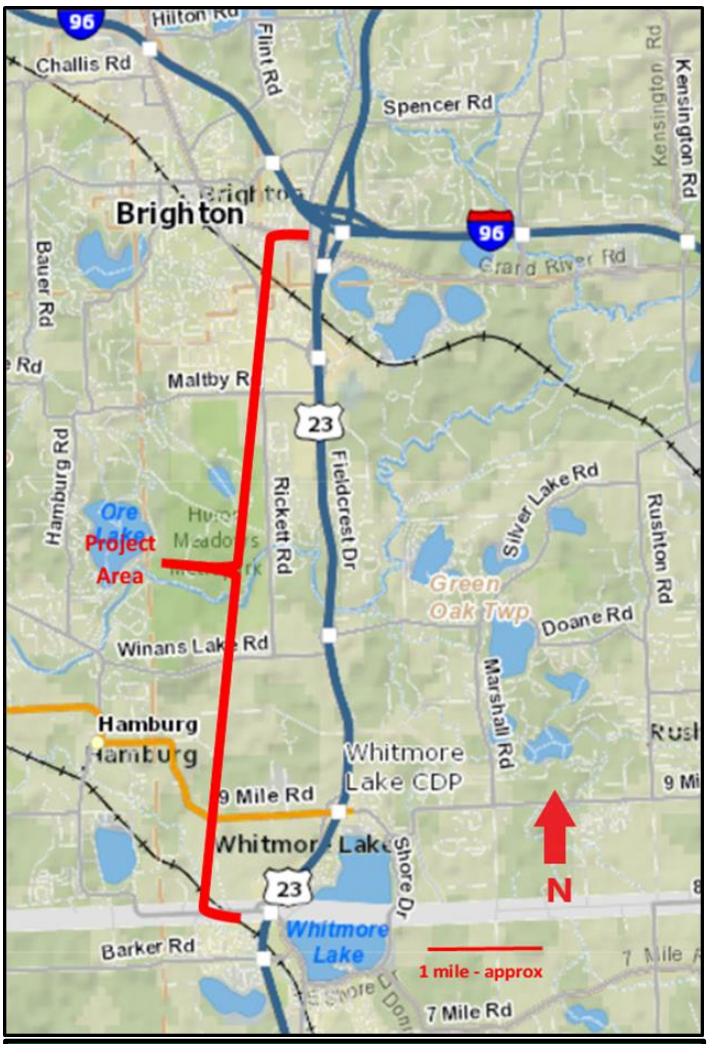

Figure 1. Project extent.

The surveys were conducted from 22 July through 9 August 2020, which includes the recommended survey periods for most the target species as determined by MNFI abstracts (MNFI 2020). Constraints due to the Covid-19 crisis, namely obtaining of waivers from the stay-at-home Executive Orders issued by the Governor of Michigan, prevented conducting surveys for those species whose optimal survey times were May-Jun. However, a number of those species have persistent parts that can be observed for an extended time. These include Richardson’s sedge (*Carex richardsonii),* sedge (*Carex squarrosa)* Clinton’s bulrush (*Trichophorum clintonii*), hairy angelica *(Angelica venenosa),* and common valerian *(Valeriana edulis).* While the optimal time for surveying for ram’s-head orchid (*Cypripedium arietinum*) and white lady’s-slipper (*Cypripedium candidum*) was missed, the survey did include search effort for appropriate habitat for these species which occur in conifer-dominated swamps and fens, respectively.

RESULTS AND DISCUSSION

Based on the search of the NHD, the species listed in Table 1 were selected as target species.

Table 1. Target species.

Scientific Name	Common Name	Status		Survey Period
		State	Federal	
Angelica venenosa	hairy angelica	SC	*	Jul - Sep
Asclepias purpurascens	purple milkweed	T	*	Jun - Aug
Astragalus canadensis	Canadian milk vetch	T	*	Jul - Aug
Bouteloua curtipendula	side-oats grama	E	*	Aug - Oct
Brickellia eupatorioides	false boneset	SC	*	Jul - Oct
Carex richardsonii	Richardson's sedge	SC	*	May - Jun
Cypripedium arietinum	ram's-head orchid	SC	*	Ma - Jun
Drosera anglica	English sundew	SC	*	Jun - Sep
Eleocharis equisitoides	horsetail spike-rush	SC	*	Aug - Oct
Eleocharis radicans	spike-rush	X	*	Jul - Aug
Geum virginiana	pale avens	SC	*	Jun - Jul
Linum virginiana	slender yellow flax	T	*	Jun - Jul
Muhlenbergia richardsonis	mat-muhly	T	*	Aug - Oct
Platanthera ciliaris	orange fringed orchid	E	*	Jul - Aug
Sporobolus heterolepis	prairie dropseed	SC	*	Aug - Sep
Platanthera ciliaris	Orange fringed orchid	T	*	Jul - Aug
Trichophorum clintonii	Clinton's bulrush	SC	*	May - Jul
Valeriania edulis	Common valerian	T	*	May - Jul
NOTES: SC – Special Concern; T – Threatened; E – Endangered; X – Extirpated; * - Not Listed				

None of the target species were found in the project area. Additionally, no appropriate habitat for those species whose optimal survey period fell outside of the survey dates was found in the project area.

The most common plant assemblage throughout the project area was found to be early successional, or "old field". Of the species recorded for the area, approximately half (34 of 63) are non-native. However, a larger number of individual plants beneficial to pollinators, both native and non-native occur within the area. While the survey was not a total inventory of all species in the area, Table 2 presents a list of the species recorded.

Table 2. Plant species recorded in the project area.

Scientific Name	Common Name	Coeff. of Cons.	TES Status	Native/ Adventive/ Physiognomy
Acer negundo	box elder	0		Nt Tree
Agrostis stolonifera	creeping bent	*		Ad P-Grass

Table 2. Plant species recorded in the project area.				
Scientific Name	**Common Name**	**Coeff. of Cons.**	**TES Status**	**Native/ Adventive/ Physiognomy**
Apocynum cannabinum	Indian hemp	3		Nt P-Forb
Asclepias verticillata	whorled milkweed	1		Nt P-Forb
Bromus inermis	smooth brome	*		Ad P-Grass
Carex lupulina	sedge	4		Nt P-Sedge
Centurea stoebe	spotted knapweed	*		Ad B-Forb
Cirsium arvense	Canada thistle	*		Ad P-Forb
Cirsium vulgare	bull-thistle	*		Ad B-Forb
Cyperus esculentus	long scaled nut sedge	3		Nt P-Sedge
Dactylis glomerata	orchard grass	*		Ad P-Grass
Daucus carota	Queen-Anne's-lace	*		Ad B-Forb
Dipsacus fullonum	common teasel	*		Ad P-Forb
Elaeagnus umbellata	autumn-olive	*		Ad Shrub
Erigeron strigosus	daisy fleabane	4		Nt P-Forb
Euphorbia maculata	nodding spurge	0		Nt A-Forb
Euthamia graminifolia	grass-leaved goldenrod	3		Nt P-Forb
Festuca rubra	red fescue	*		Ad P-Grass
Hypericum perforatum	common st. john's-wort	*		Ad P-Forb
Juncus dudleyi	Dudley's rush	1		Nt P-Forb
Juniperus virginiana	red-cedar	3		Nt Tree
Lespedeza capitata	round-headed bush-clover	5		Nt P-Forb
Leucanthemim vulgare	ox-eye daisy	*		Ad P-Forb
Lolium perenne	perennial rye grass	*		Ad P-Grass
Lotus corniculata	birdfoot trefoil	*		Ad P-Forb
Lysimachia nummularia	moneywort	*		Ad P-Forb
Lythrum salicaria	purple loosestrife	*		Ad P-Forb
Melilotus alba	white sweet-clover	*		Ad B-Forb
Melilotus officinalis	yellow sweet-clover	*		Ad B-Forb
Muhlenbergia asperifolia	muhly grass	*		Ad P-Grass
Phalaris arundinacea	reed canary grass	0		Nt P-Grass
Phleum pratense	timothy	*		Ad P-Grass
Phytolacca americana	pokeweed	2		Nt P-Forb
Plantago lanceolata	English plantain	*		Ad P-Forb
Plantago major	common plantain	*		Ad P-Forb
Poa compressa	Canada bluegrass	*		Ad P-Grass
Poa pratensis	Kentucky bluegrass	*		Ad P-Grass
Populus deltoides	cottonwood	1		Nt Tree
Prunella vulgaris	lawn prunella	0		Nt P-Forb
Rhamnus frangula	glossy buckthorn	*		Ad Shrub
Robinia pseudoacacia	black locust	*		Ad Tree
Rudbeckia hirta	black-eyed susan	1		Nt P-Forb
Rumex crispus	curly dock	*		Ad P-Forb
Schoenoplectus pungens	three-square	5		Nt P-Sedge

Table 2. Plant species recorded in the project area.				
Scientific Name	**Common Name**	**Coeff. of Cons.**	**TES Status**	**Native/ Adventive/ Physiognomy**
Setaria faberi	giant foxtail	*		Ad A-Grass
Setaria viridis	green foxtail	*		Ad A-Grass
Solidago altissima	tall goldenrod	1		Nt P-Forb
Solidago nemoralis	old-field goldenrod	2		Nt P-Forb
Solidago riddellii	Riddell's goldenrod	6		Nt P-Forb
Spartina pectinata	cordgrass	5		Nt P-Grass
Symphyotrichum laeve	smooth aster	5		Nt P-Forb
Symphyotrichum lateriflorum	side-flowering aster	2		Nt P-Forb
Trifolium pratense	red clover	*		Ad P-Forb
Trifolium repens	white clover	*		Ad P-Forb
Typha angustifolia	narrow-leaved cat-tail	*		Ad P-Forb
Ulmus americana	American elm	1		Nt Tree
Verbascum blattaria	moth mullein	*		Ad B-Forb
Verbascum thapsus	common mullein	*		Ad B-Forb
Verbena hastata	blue vervain	4		Nt P-Forb
Verbena urticifolia	white vervain	4		Nt P-Forb
Vitis riparia	riverbank grape	3		Nt W-Vine

The following are photos depicting typical conditions throughout the project area, as well as a few areas of note.

Figure 2. Typical old field mixture of grasses, forbs, and shrubs. West side of Hwy 23, south of Grand River Ave. Dominant vegetation includes smooth brome, tall goldenrod, common milkweed, and red cedar.

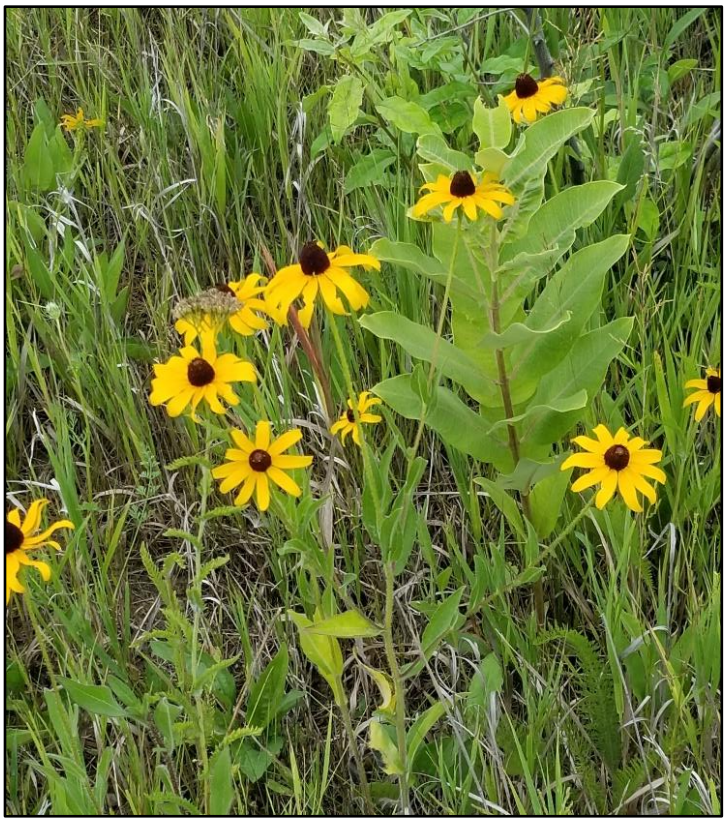

Figure 3. Pollinator-friendly species; black-eyed Susan and common milkweed. West side of Hwy 23, south of Grand River Ave. There was an abundance of pollinator-friendly species throughout the project area.

Figure 4. Un-mowed swale; NW corner of Lee Road interchange.

Figure 5. Cat-tail stand in ditch. East side of Hwy 23 along Field Crest Road near intersection with Winding Pines Road.

Figure 6. Potential bat roost tree. East side of Hwy 23, between Silver Lake Road and 9-mile Road. Lat, Long: N 42 27.189, W83 45.109

Figure 7. Typical mowed cloverleaf loop. NW corner of 9-mile Road interchange.

Figure 8. 9-mile Road interchange wetlands. While there are many wetland areas throughout the project area, consisting mainly of ditches, two relatively substantial wetland areas occur at the 9-mile Road interchange. One is a cat-tail marsh, while the other is a linear wetland taking up much of the area between Hwy 23 and Whitmore Lake Road.

Figure 9. Cat-tail marsh. NE corner of 9-mile Road interchange. Area is likely unsuitable for construction staging.

Figure 10. Wetland area on west side of US Hwy 23 at 9-mile Road. This wetland extends toward Whitmore Lake Road.

Figure 11. Stand of black locust at terminus of project at 8-mile Road.

Acknowledgements

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