Rare Plant Surveys for the Michigan Department of Transportation: Vista Way, Center Avenue and Oakway Trail Bridges, Belle Isle, Michigan

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11/31/2020

MNFI Report No. 2020-19

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Suggested Citation:

Higman, P.J. 2020. Rare Plant Surveys for the Michigan Department of Transportation: Vista Way, Center Avenue and Oakway Trail Bridges, Belle Isle, Michigan. MNFI Report No. 2020-19. Lansing, MI.

Cover: Oakway Trail Canoe Stream Crossing. Photo by Phyllis J. Higman

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Introduction

This report provides a summary of rare plant surveys along rights-of-ways in the vicinity of Vista Way, Central Avenue and Oakway Trail bridges that cross over Canoe Stream on Belle Isle in Detroit, Michigan (Figure 1). Surveys are needed prior to tree and bridge removal and bridge replacement on Vista Way and substructure repairs and repaving road sections of bridges and approaches along Central Ave and Oakway Trail. These surveys are required to ensure compliance with Federal and State Endangered Species Acts for work specified in MDOT Projects 128554 and 128561.

Figure 1. Survey areas for Vista Way, Center Avenue and Oakway Trail bridge crossings on Belle Isle, Detroit, Michigan.

Methods

A review of the Michigan Natural Heritage database was conducted to identify Federal or State Endangered or Threatened, or State Special Concern species that have potential to occur in the survey areas shown in Figure 1. Three state-listed species were identified as targets, all of which can be detected during late-season surveys (Table 1). No Federally-listed plants were identified as potential targets.

Table 1. Species targeted during late-season surveys.			
Scientific Name	**Common Name**	**Listing Status***	**Best Survey Time**
Asclepias sullivantii	Sullivant's milkweed	T	September-October
Fraxinus profunda	pumpkin ash	T	August-September
Quercus shumardii	Shumard oak	SC	July-August

*T: state threatened; SC: state special concern

Aerial photos of the survey area were reviewed to become familiar with the survey area and determine best access areas. On-foot meander surveys were conducted throughout the entire right-of-way along a 100-foot wide corridor from the centerline for approximately 250 feet on both sides of the road at each bridge. Clearance for travel to Wayne County was not granted until mid-September due to the COVID Pandemic, and surveys were ultimately conducted on October 22nd and 26th, 2020. Descriptions with dominant species observed were noted and representative photos were taken of the survey areas extending from the northeast, southeast, southwest, and northeast corners of each of the three bridges.

Results

Summary

Due to the COVID clearance delay, we were unable to conduct these surveys during the optimal survey window for all three targets in late August to early September, as planned. However, all three species are easily detectable by experienced surveyors, well into October.

The Oakway trail and Central Avenue bridges lie within the boundary of an occurrence of a globally vulnerable to imperiled (G2G3) and state imperiled (S2) wet-mesic flatwoods one of only 11 currently known in the state (Cohen et. al 2005; NatureServe 2020). However, they mostly lie at the somewhat degraded edges of the forest, with numerous non-native and invasive species in the shrub and ground layers. There were several mowed and maintained areas. The Vista Way bridge lies just outside the boundary of the flatwoods and is mostly mowed and maintained, but there is a prominent hiking trail at the west edge of the survey area leading into the heart of forest. None of the target species were documented in any of the three survey areas; however, a Shumard oak was observed well east of the Vista Way bridge.

Two occurrences of Oriental bittersweet and one of tree-of-heaven were also mapped. These are high impact invasive species that are locally isolated in the survey area, unlike several invasive shrubs and forbs that are more pervasive.

Descriptions of vegetation at each bridge location

Oakway Trail Bridge

Northeast Corner: This is a fully canopied forest with large, widely spaced, mature bur oak (*Quercus macrocarpa*), swamp white oak (*Quercus bicolor*), pin oak (*Quercus palustris*), red maple (*Acer rubrum*) and green ash (*Fraxinus pensylvanica*), and mostly young ash and maple in the understory (Figure 2). Black raspberry (*Rubus occidentalis*) is dominant in the shrub layer

and there was a diverse native ground cover including panicled aster (*Symphyotrichum lanceolatum*), New England aster (*Symphyotrichum novae-angliae*), tall goldenrod (*Solidago altissima*), fen willow-herb (*Epilobium leptophyllum*), nodding smartweed (*Persicaria lapathifolia*), blue vervain (*Verbena hastata*), enchanter's nightshade (*Circaea canadensis*), wood reedgrass (*Cinna arundinacea*), white grass (*Leersia virginica*), and several sedges (*Carex cristatella*, *C. muskingumensis* and others). Reed-canary grass (*Phalaris arundinacea*) is established and spreading in forest openings. Just south of the bridge crossing is a parking area with a trail into the woods that follows Canoe stream northeast towards Lake Muskoday.

Figure 2. Canopied forest at Oakway Trail bridge. NW corner is on the left, NE corner on right.

Figure 3. Oakway trail with parking area, swamp white oak and New England aster.

Northwest Corner: The canopied forest extends across the stream to the northeast corner of the bridge crossing (Figure 2, 3). West of the forest edge is a large disturbed wet opening with tall goldenrod, tall fescue, and purple loosestrife (*Lythrum salicaria*). It is highly disturbed and is undergoing invasion by Eurasian phragmites and narrow-cat-tail (Figure 4).

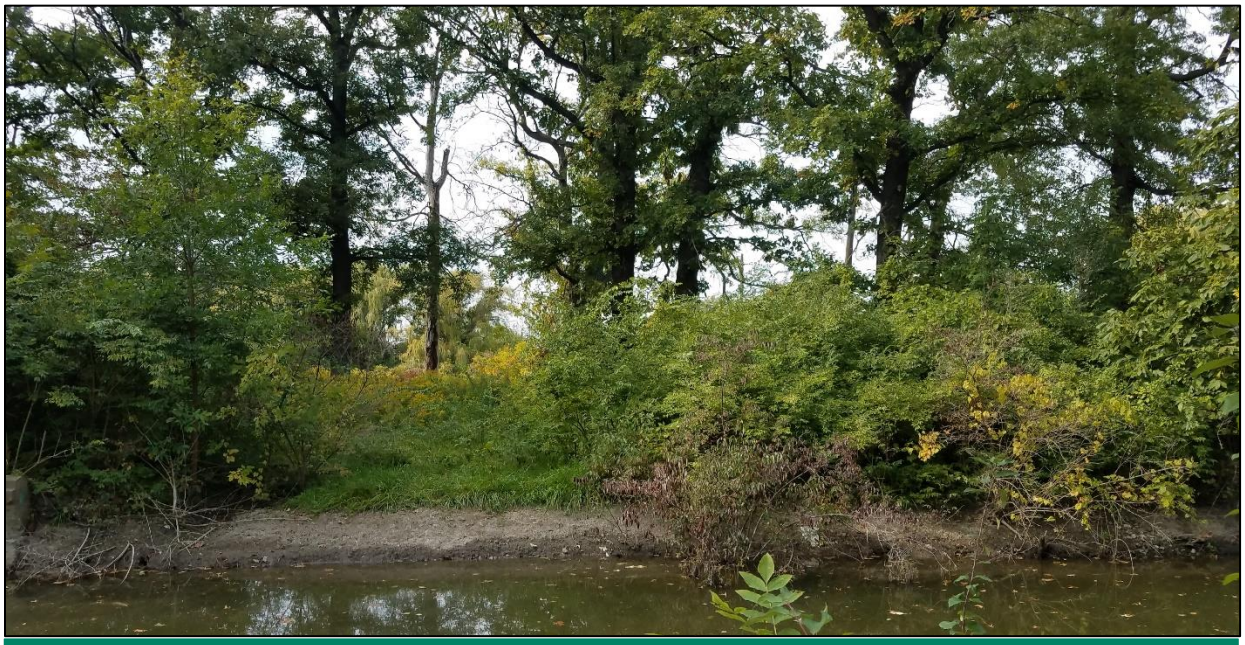

Figure 3. Canopied forest in the northwest corner of Oakway Trail bridge crossing.

Figure 4. Wet opening west of forest with Eurasian phragmites in background and tall goldenrod bordering the southern edge along the Oakway Trail.

Southwest Corner: Here, there are fewer canopy trees, many young green ash trees and the shrub layer is heavily invaded by invasive Amur honeysuckle (Figure 5). Other shrubs and vines include riverbank grape (*Vitis riparia*), Virginia creeper (*Parthenocissus* sp.), *European highbush-cranberry (Viburnum opulus),* common buckthorn (*Rhamnus cathartica*), and common privet (*Ligustrum vulgare*). This shrubby area transitions westward to a wet meadow-like

opening (Figure 6) with a diversity of native forbs, including grass-leaved goldenrod *(Euthamia graminifolia*), tall goldenrod (*Solidago altissima*), panicled aster (*Symphyotrichum lanceolatum*), heath aster (*Symphyotrichum ericoides*), cinnamon willow-herb (*Epilobium coloratum*), common beggar-ticks (*Bidens frondosa*), smartweed (*Persicaria* sp.), pileweed (*Erechtites hieraciifolius*), Bebb's sedge (*Carex bebbii*), and Torrey's bulrush (*Schoenoplectus torreyi*).

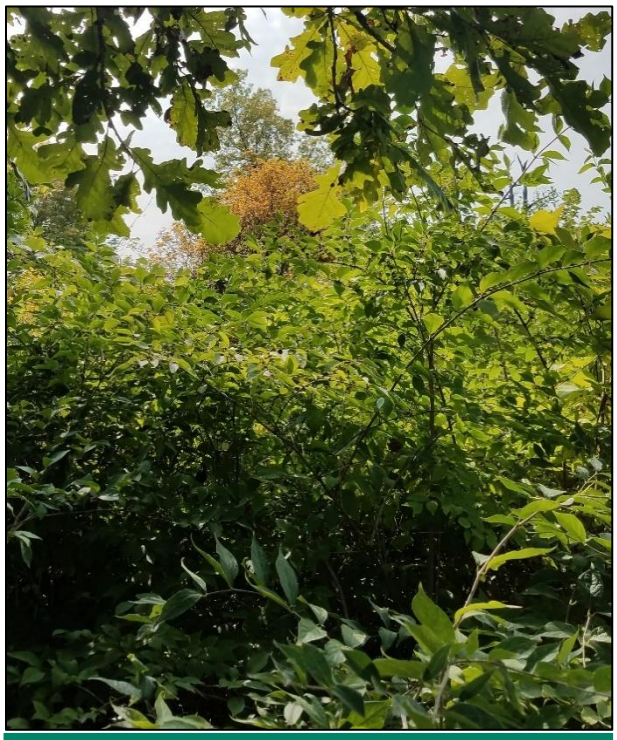

Figure 5. A dense invasion of Amur honeysuckle under a sparse canopy.

Figure 6. Wet meadow-like opening with green ash in the foreground.

Many non-native species were also established, especially near the road edge, including curly dock (*Rumex crispis*), *Hypericum perforatum* (common St. John's-wort), *Daucus carota* (wild carrot), heal-all (Prunella vulgaris), sow thistle (*Sonchus* sp.), Canada thistle (*Cirsium arvense*), orchard grass (*Dactylis glomerata*), tall fescue (*Lolium arundinacea*), barnyard grass (*Echinochloa* sp.), reed canary grass (*Phalaris arundinacea*), and Eurasian phragmites (*Phragmites australis*). The latter two species were not yet abundant or dominant in this area.

Southeast Corner: This area is mostly a weedy thicket of vines and shrubs with a few canopy oaks and red maple, green ash, and willow in the understory (Figure 7). Dominant shrubs and vines include staghorn sumac (*Rhus typhina*), riverbank grape, and the highly invasive species Oriental bittersweet (*Celastrus orbiculatus*) and multiflora rose (*Rosa multiflora*). This zone transitions south and eastward to mature canopied forest similar to that on the NE and NW corners. Additional species observed here include silver maple (*Acer saccharinum*) and cottonwood in the canopy, American elm in the understory, poison ivy (*Toxicodendron radicans*) and spicebush (*Lonicera benzoin)* in the vine and shrub layer, and pileweed (*Erechtites hieraciifolius*), wood nettle (*Urtica dioica*), arrow-leaved aster (*Symphyotrichum urophyllum*), and periwinkle (*Vinca minor*) in the ground later. A GPS point was taken for the Oriental bittersweet and the shapefile is delivered with this report.

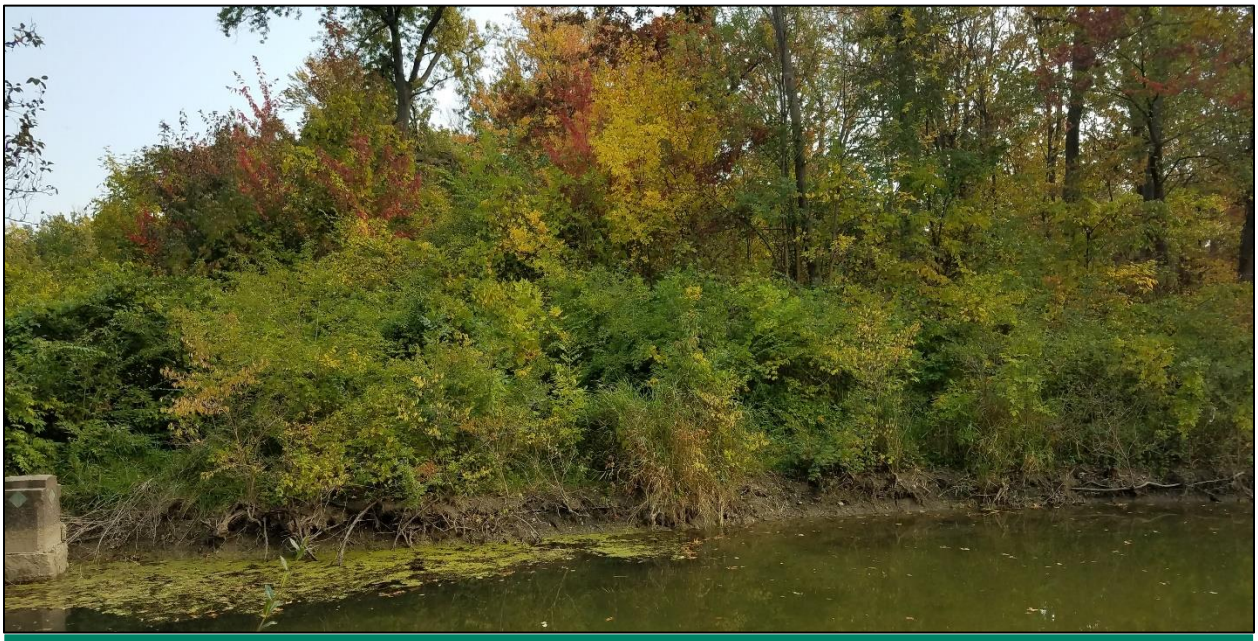

Figure 7**.** View of the weedy thicket at the southeast corner of the Oakway Trail crossing.

Central Avenue Bridge

Northeast Corner: A weedy shrub and young tree zone with green ash, American elm, silver maple and catalpa (*Catalpa speciosa*) borders the stream. It is dominated by a mix of native and non-native shrubs and vines including native riverbank grape, poison ivy, Virginia creeper, common blackberry (*Rubus alleghaniensis*), spice bush, gray dogwood (*Cornus foemina*), swamp rose (*Rosa palustris*), and invasive Amur honeysuckle, Morrow's honeysuckle (*Lonicera morrowii*), and multiflora rose (Figure 8). Ground flora includes arrow-leaved aster, panicled aster, tall goldenrod, white grass, and incursions of reed canary grass.

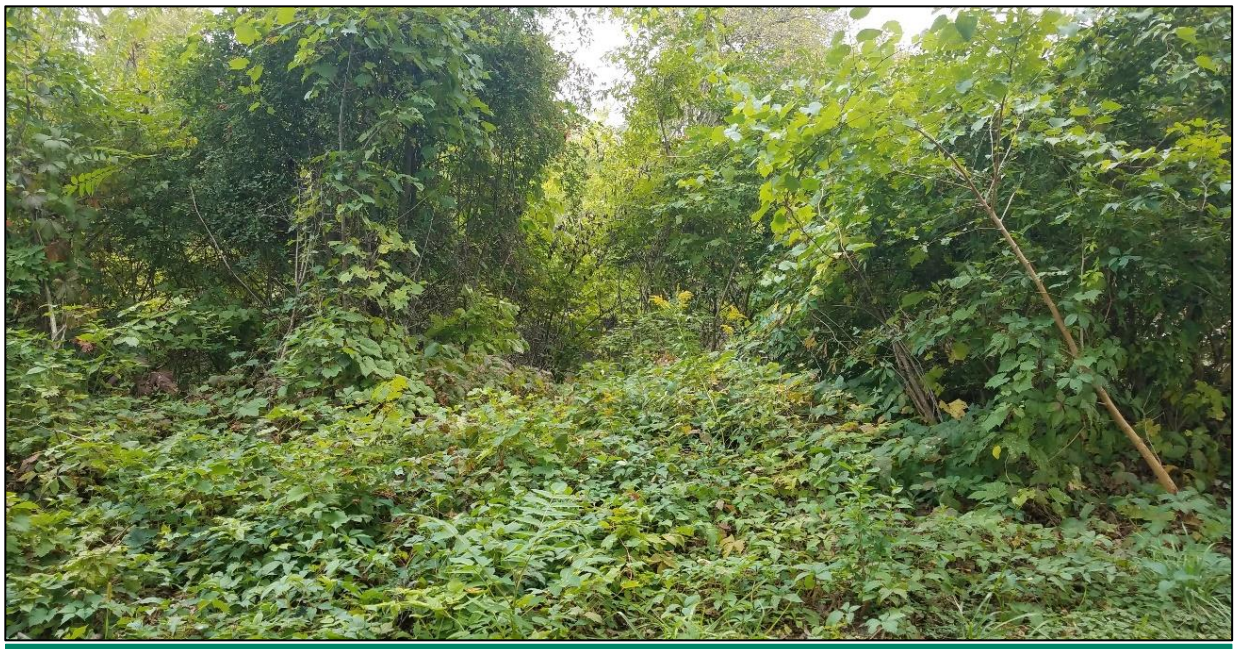

Figure 8. Dense shrubs, vines and young trees border the north side of the river at the Central Avenue crossing.

The shrub-thicket transitions to a small patch of mature pin oak and green ash surrounded by younger pin oak and green ash, with a similar composition of shrubs and vines (Figure 9). Directly adjacent to the road further east are large openings dominated by reed canary grass, Canada thistle, and pileweed (Figure 10). Central Ave. forks directly east of the river, creating an island of vegetation in between the forks that is also young forest dominated by green ash.

Figure 9. Weedy young woods northeast of the stream (left) and vegetated island (right).

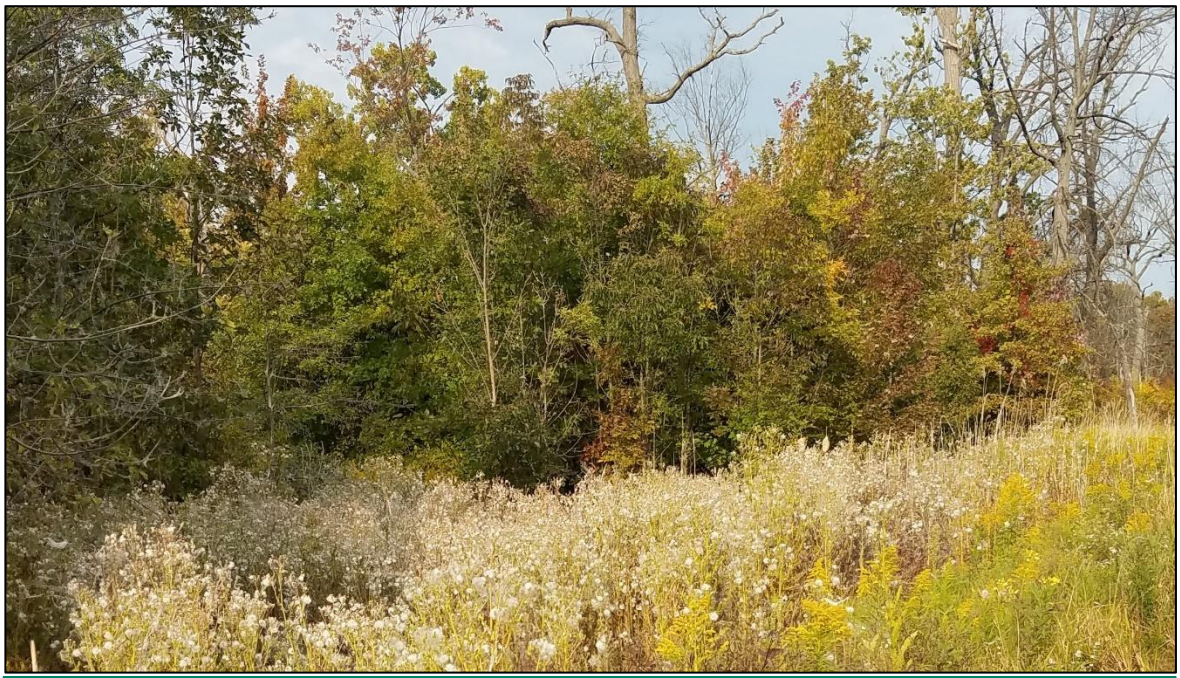

Figure 10. Weedy opening east of the stream along Central Avenue.

Northwest Corner: The stream is bordered by the same weedy shrub-young tree zone as on the northeast corner, and directly west is mowed lawn with large, widely spaced, mature swamp white oak and silver maple (Figure 11). Amur honeysuckle, multiflora rose. Canada thistle, sow thistle, and burdock(*Arctium minus*) were observed along the border between the two zones. Also, two high impact invasive species were mapped here: Oriental bittersweet and tree-of-heaven (*Ailanthus altissima*, Figure 12).

Figure 11. Shrub thicket and mowed lawn at the northeast corner of the Central Avenue crossing.

Figure 12. Tree-of-heaven (left) and Oriental bittersweet at the northeast corner of the Central Avenue bridge crossing.

Southwest Corner: The area **i**mmediately adjacent to the stream is a disturbed forest with young green ash, riverbank grape, Virginia creeper, and Amur honeysuckle, and occasional canopy swamp white oak, pin oak and green ash (Figure 13).

Figure 13. Southwest corner of the Central Avenue crossing with occasional canopy trees.

Southeast Corner: This corner is a fully canopied forest dominated by swamp white oak, pin oak, silver maple, and green ash. Green ash and American elm are in the understory and riverbank grape, poison ivy, Virginia creeper, blackberry, spice bush, and Amur honeysuckle are common in the shrub layer. Ground flora includes tall goldenrod, panicled aster, arrow-leaved aster, white grass, and reed canary grass.

Figure 14. Canopied forest at the southeast corner of the Central Avenue crossing.

Vista Way Bridge just south of Loiter Way

Northeast Corner: This is mostly shrubs and small trees, with gray dogwood, common buckthorn, Amur honeysuckle, lilac (*Syringa vulgaris*) and green ash (Figure 15). A large swamp white oak is in the canopy and a single honey locust (*Gleditsia tricanthos*) lies at the intersection of the bridge and the road. Other common species include river-bank grape, black raspberry, poison ivy, Virginia creeper and Oriental bittersweet. The ground cover is sparse with a calico aster in the shrubs and creeping bent (*Agrostis stolonifera*) on the exposed streambank.

Figure 15. Northeast corner of the Vista Way crossing, showing a thicket of shrubs along the stream.

Figure 16. Northwest corner of Vista Way crossing showing mowed strip along the stream.

Northwest Corner: The northwest corner is a mowed lawn with occasional cottonwood and catalpa trees. Loiter Way St. lies directly north of this and north of that is a fenced woodland. Canopy and understory species observed from the fence include, swamp white oak, bur oak, cottonwood, green ash, black locust (*Robinia pseudo-acacia*), northern catalpa (*Catalpa speciosa*), and white mulberry *(Morus alba*). Riverbank grape, common buckthorn and Amur honeysuckle are in the shrub layer (Figure 16).

Southwest Corner: The Belle Isle Athletic Center is located at this corner, with a mowed lawn and ball field. There is sparse vegetation along the stream edge including horse chestnut (*Aesculus glabra*), green ash, river-bank grape, gray dogwood, Amur honeysuckle, narrow-leaved cat-tail (*Typha angustifolia*), *Eurasian* phragmites, and three square (*Schoenoplectus pungens*) (Figure 17).

Figure 17. Belle Isle Athletic Center (left) and sparse vegetation on the shoreline (right).

Southeast Corner: This area is mostly a mowed recreation area with widely spaced mature oaks and a parking lot (Figure 18). There is a narrow strip of shrubby vegetation at the edge of the stream, with *Crataegus* sp., green ash saplings, river-bank grape, poison ivy, Amur honey-suckle, Siberian elm (*Ulmus pumila*), glossy buckthorn *la* (*Alnus frangula*), and common buckthorn (Figure 19).

Figure 18. Southeast corner of Vista Way crossing with canopied woodland on the right.

The woodland edge east of the of the mowed zone is fully canopied with pin oak, bur oak, swamp white oak, red maple, and silver maple. (Figure 18, right). Shrubs include American elm, box elder (*Acer negundo*), wild red raspberry (*Rubus strigosus*), river-bank grape, Amur honeysuckle, and common buckthorn. At the stream's edge, a trail leads eastward into the woodland. This wooded zone borders the westward edge of an imperiled wet-mesic flatwoods natural community in which state special concern Shumard oak (*Quercus shumardii*) and state threatened *Fraxinus profunda* (pumpkin ash) are known (Figure 19). Neither of these two species were located within the survey area; however, Shumard oak was observed approximately well east of the trail head.

Figure 19. Shrubby edge along the stream (left) and trail leading to an occurrence of wet-mesic flatwoods with Shumard oak outside of the survey area.

Discussion

No rare species were documented in the survey area; however, the Vista Way bridge crossing lies just west of a trail leading into the heart of one of Belle Isle's ecological gems—an occurrence of wet-mesic flatwoods that harbors state threatened pumpkin ash and state special concern Shumard oak (Figure 20). This natural community type is vulnerable to imperiled globally and imperiled in the state (S2). It is the largest (197 acres) of only 11 occurrences known in Michigan. When it was documented by MNFI in 2012, it was given a quality rank of D due to the many undergoing threats including loss of canopy ash and oak due to invasion by the emerald ash borer, and oak wilt (condition), and its surrounding landscape context, which is fairly degraded with little to no buffer. These ranks are assigned by the surveyor on a scale of A-D, with A as highest quality, based on the size, condition and landscape context of the community. In spite of its low rank, because it is a significant feature both for Belle Isle and the

state of Michigan, the site has been prioritized for restoration. Extensive and active study and stewardship is currently on-going, with the goal of improving its condition and probability of persistence with characteristic native species and ecological processes and functions intact. While it was not the goal of this project to thoroughly survey areas adjacent to the survey area, during our brief scoping of Vista Way, a Shumard oak was observed, well to the east of the MDOT project survey area. All precautions should be taken to avoid direct and indirect impacts to the woods on the east side of the Vista Way crossing during tree and bridge removal and replacement.

Figure 20. Map showing the delineation of a globally vulnerable and state imperiled wet-mesic flatwoods on Belle Isle.

Occurrences of Oriental bittersweet and tree-of-heaven were documented at the Central Avenue bridge, and a second occurrence of Oriental bittersweet was documented at the Oakway Trail Bridge (Figure 20). While there were many occurrences of invasive species during surveys, particularly Amur honeysuckle, common buckthorn and multiflora rose, the Oriental bittersweet and tree-of-heaven occurrences were locally isolated and not widespread where they were found. Control measure are recommended to minimize their spread into other areas during activities associated with upgrading the bridges. In addition, those involved with the bridge work should take measures to avoid the creation of any pathways into the adjacent woods that could facilitate the spread of invasive species. Shapefiles for the highlighted locations of tree-of-heaven and Oriental bittersweet accompany this report.

Figure 21. Locations of Oriental bittersweet and tree-of-heaven documented during surveys conducted at Oakway Trail, Central Avenue and Vista Way bridges on Belle Isle in 2020.

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NatureServe, 2020. Definitions of NatureServe Conservation Status Ranks. Available https://help.natureserve.org/biotics/content/record_management/Element_Files/Element_Tracking/ETRACK_Definitions_of_Heritage_Conservation_Status_Ranks.htm (Accessed: 11/30/20)

Acknowledgements

We thank David Schuen at MDOT for project funding and coordination. Ashley Adkins, Brian Klatt, and Nancy Toben provided administrative assistance.