Restoration Along the Ahnapee Trail

The Path to Ecological Health

Prepared for: Crossroads at Big Creek

July 2022, Volume 1

Benjamin Kielar | bkielar2@gmail.com

Introduction

Site Description and Context

This restoration site sits on the far west side of Crossroads property where the highway runs adjacent. It runs from Michigan street south to Utah street along the Ahnapee trail and from the Department of Transportation property line east to roughly/slightly into the woods (where there are woods) and an imagined line connecting the woods (where there are not woods).

Rationale for Site Selection: This section of Crossroads campus at the Ahnapee trail feels forgotten and undermanaged. There are some invasives and between the highway and the trail where there is also somewhat of a wildlife corridor in need of improved continuity, as there are significant breaks in the trees/shrubs. The entire area has been and continues to be impacted by multiple anthropogenic activities – the ATC corridor, the Ahnapee trail and the highway.

General Information on the Restoration Site: On the Door County GIS Webmap the area extending from Michigan street south to Utah street is split into four parcels. The far north and south parcels are already owned by Crossroads and the two in between are currently listed under ownership of Wisconsin DNR and Sturgeon Bay Utilities. The parcels total about 11.75 acres but the area of restoration for this project can be estimated at roughly 8 to 10, although individual zones of restoration will be less. Between the highway on the west and the trail it is open/meadowy to shrubby to wooded, all in patches. On the east side of the trail it is largely wetland (implicit or apparent), with wet mesic forest forming the eastern edge at most points along the trail.

The Geographic Context: The restoration site is part of Crossroads At Big Creek, the Big Creek watershed (something to note is its proximity to the beginning of a Big Creek tributary).

Nearby/connected areas are Big Creek, The Cove (by extension), and the canal/Lake Michigan (again by extension) as well as wooded areas on the east of the restoration site.

The Human Community: Crossroads visitors, highway drivers and Ahnapee trail users are direct human connections. Stakeholders include (but are not limited to) permanent and tourist/seasonal residents, animals and plants of the immediate area as well as those of the areas the runoff/water from this area passes through or enters into. Ultimately, this restoration site can provide people (especially those who would already use the area) the opportunity to see entirely new things or old things in a new way.

Restorative Vision: Reducing/eliminating invasive species; creating as much continuity as possible given the proximity of man-made structures and subsequent constraints; forming zones of health that represent potential and possibility of this site (and others like it 😊) and can radiate outward

Site History

Of the four parcels on the Door County GIS webmap, all were at least partially cherry orchard –over the years - the webmap shows if the parcel was orchard in 1938, 1954, 1961 and/or 1974 surveys. On one parcel the webmap gives the description of "housing" in 1974, although what that exactly means is not apparent. Besides the effects of long-sustained agricultural practices, implementation and subsequent use of the highway, power line, and paved Ahnapee trail all have varying initial and continuing effects on the area. Although the direct effects of these may not be initially apparent or recognizable even with further investigation, proximity to much and varied human activity along with little work being done with the area in recent years suggest it's been

left to its own devices. As a result, undesirable species and poor structure have been able to establish themselves from relatively low quality past conditions post-orchard and construction.

Today there are some well-established trees, groupings of trees/shrubs, shrub-dominated areas, as well as open areas. However, invasives are at least minorly ubiquitous, and diversity everywhere and continuity among the shrub/tree areas between the trail and the highway should be improved.

Restrictions on the landscape include the extent that the DOT manages along the highway, the amount that is mowed along the Ahnapee trail, and any restrictions related to the ATC corridor, such as tree height.

Vision for the Site

As a reference for informing the restoration of this site, four Wisconsin DNR-recognized natural communities found on the Wisconsin DNR website are listed and connected to the restoration site. In this way they can act as guides for achieving healthy native communities.

Northern wet-mesic forest is a suitable model for the forest margin up towards Michigan street and to the east of the trail where it is currently dominated by blue spruce. Trees like white cedar, balsam fir (*Abies balsamea*), black ash (*Fraxinus nigra*) and spruces (*Picea spp.*) comprise the overstory with an understory of sedges (*Carex spp.*), ferns and mosses.

Shrub carr is a useful reference for areas further south and west of the trail where wetland

conditions indicate this community would flourish and act as a transition between more open wetland meadow and forested wetland. Species emblematic of this community include red-osier (*Cornus sericea*) and silky dogwood (*Cornus amomum*), meadowsweet (*Spiraea alba*) and multiple willows (*Salix spp.*) along with canada bluejoint grass (*Calamagrostis canadensis*).

Northern sedge meadow works well as another reference since there are already various sedges already established along most of the trail. This implies that the area could be conducive to other sedges and thus support a healthy, diverse sedge meadow. There are multiple sub-types of sedge meadow, with the most likely candidate for this site being a tussock meadow consisting largely of tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*).

A bracken grassland, although not strictly native to Door County, is indicative and reminiscent of a northern setting, and may be an option for more dry, open, somewhat-sandy soil areas that are currently overrun by weedy species. This community, as the name suggests, contains bracken fern (*Pteridium aquilinum*) plus grammanoids like Pennsylvania sedge (*Carex pensylvanica*), Canada bluegrass (*Poa compressa*) and Kalm's brome grass (*Bromus kalmii*) and plants typical of a meadow area such as goldenrod (*Solidago spp.*) and wild strawberry (*Fragaria vesca*).

Beyond these recognized plant communities, there are other goals to work towards:

- Forming continuity in the area between the highway and the Ahnapee trail to minimize noise from the highway and provide a connected (rather than patchy) wildlife corridor. For example, while walking along the trail on a breezy day, the rustling of the cottonwoods act as a sort of noise-cancellation in addition to the large trees physically blocking sound.
- Creating zones of restoration (possibly with signage) that are highly functional but also offer an educational aspect and contribute to the experience of people who visit the area.

Taken altogether, these goals all contribute to decreasing invasives and increasing ecological quality and diversity.

The How

The implementation approach of this restoration site takes into account the goals above and the time necessary for feasibility. Removal of invasives is one aspect of the project (see charts below) and while the species listed are the main aggressors, there are certainly others. Each invasive species is prioritized based on the threat they pose to spread and proliferate, and the time it would take to execute removal/treatment. Subsequent and separate native planting is another aspect of the holistic restoration of this site. Within this is the concept of self-regulated native recolonization through use of the Bradley Method (see resources section for detailed description). Over a long period of time, removal of invasives allows surrounding natives to inhabit the newly opened area. NOTE: This and other zones of removal, planting and restoration can be used as impromptu or structured experimentations pertaining to what does/doesn't work and how to most effectively proceed within different settings of plants and topography/land.

Non-Woody Plants	Priority	Comments	Treatment
Phragmites (*Phragmites australis*)	High	Not yet widespread, prevention is key	Cut and treat
Exotic cattail (*Typha angustifolia* or hybrid)	High	Not yet widespread, prevention is key	Cut below waterline or hand pull
Reed Canary Grass (*Phalaris arundinacea*)	Medium	Limited to patches of monoculture but prevention of further spread is important	Cut, bundle and treat; seed top, hand pull, (controlled burn)
Canada Thistle (*Cirsium arvense*)	Low	Very widespread but not taking over	Hand pull

Woody Plants	Priority	Comments	Treatment
Exotic Honeysuckle (*Lonicera spp*)	High	Widespread/dense in areas and very berry-producing, getting on piece by piece removal (to maintain corridor) is key	Cut and stump treat
Glossy Buckthorn (*Frangula alnus*)	High	Have taken over nearby forest understory, prevent spread	Cut and stump treat
Scotch Pine (*Pinus sylvestris*)	High	A few sizable trees and many smaller ones (quick/easy removal); some on DOT land	Cut and stump treat or girdle larger trees, hand pull smaller trees

Black Locust (*Robinia pseudoacacia*)	Medium	Confined to one dense stretch, potentially allelopathic (adapt plan if confirmed); piece by piece removal (to maintain corridor) is key	Cut and stump treat
Norway Maple (*Acer platanoides*)	Medium	A few well established trees, on DOT land; prevention of further spread is important	Cut
Blue Spruce (*Picea pungens*)	Low	Entire woods dominated by them, slow and progressive replacement is ideal	Cut or girdle

Goals for the restoration site (roughly north to south along the trail):

As a caveat, for the area between the highway and the Ahnapee trail, the idea is to provide continuity to the currently fractured wildlife corridor. The conceptual method for this in the context of this restoration plan is to remove and replace invasives chunk by chunk rather than all at once, to allow continuity to remain somewhat stable and give natives that are planted time to establish and grow. This pertains primarily to the removal and replacement of black locust and honeysuckle.

1) Remove and replace blue spruce over time, soften wood edge by providing successional area under the powerline to the west
    a) Good replacement species could be: red cedar (*Juniperus virginiana*), northern white pine (*Pinus strobus*) and red pine (*Pinus resinosa*)

b) Create successional zone with medium height species like common elderberry (*Sambucus canadensis*), common ninebark (*Physocarpus opulifolius*) and round-leaved dogwood (*Cornus rugosa*)

c) Establish a bracken grassland (bracken ferns (*Pteridium aqualinum*) are already well established in the understory of the bordering woods) to the west of the wooded area

2) Incrementally remove black locust (*Robinia pseudoacacia*) "grove" and replace with shrubs/trees up to the DOT property line to provide shade and work towards better continuity

    - Plants may include but are not limited to: (cherry (*Prunus spp.*), plum (*Prunus spp.*) and common serviceberry (*Amelanchier arborea*)

3) Create a natural pollinator zone that is highly functional but also aesthetically pleasing in the area of overlap where a small trail connects a larger Crossroads trail and the Ahnapee trail as they flank an open/meadow area. This zone will ideally contain early, mid and late season native plants to offer a range of beauty and texture throughout the year.

    - Plants may include but are not limited to: lanceleaf coreopsis (*Coreopsis lanceolata*), butterfly milkweed (*Ascleptas tuberosa*), prairie blazing star (*Liatris pycnostachya*) and new england aster (*Symphyotrichum novae-angliae*)

      NOTE: these four represent an early, mid, mid-late and late bloom period, respectively

4) Remove glossy buckthorn (*Frangula alnus*) from the forest edge/into the forest to prevent spread/proliferation and allow natives to repopulate the undergrowth

5) Incrementally remove exotic honeysuckle (*Lonicera spp*) and replace with native shrubs/ trees up to the DOT property line to provide shade work towards better continuity
    - Plants may include but are not limited to: cherry (*Prunus spp.*), plum (*Prunus spp.*) and downy serviceberry (*Amelanchier arborea*)
6) Plant trees like pine (*Pinus spp.*), oak (*Quercus spp.*) and cottonwood/aspen (*Populus spp.*) that offer areas south of the ATC corridor long term stability and, on the west side of the trail, act as a barrier to highway noise
7) Form northern sedge meadow using the DNR community description as a guide and incorporating other species such as blue flag iris (*Iris versicolor*)

Methods for Engaging People:

- Invasive removal volunteer opportunities allow people to know/understand the restoration taking place while feeling connected to it by participating.
- Walkthrough tours to showcase restoration in progress that includes: explaining what needs to go, what can and will be implemented and an overview of the different areas along the trail and how they are unique. This generally familiarizes them with ecological restoration, the site, and specific areas within the site.

Monitoring and Management

Monitoring and management can be carried out in various manners, including:

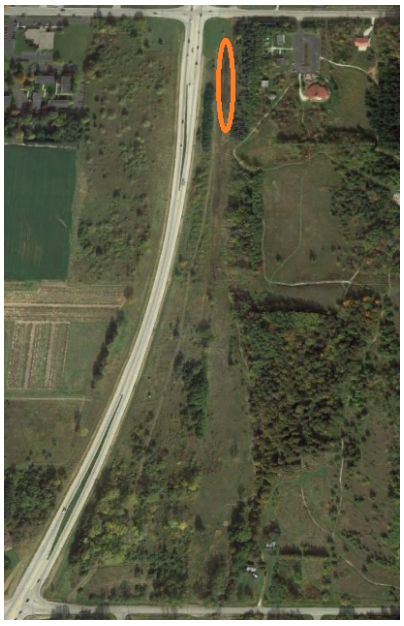
- Crossroad employee-based monitoring
- Independent community – based monitoring

- Volunteer opportunities for tracking/gauging progress (decrease in invasives, growth/survival of plantings, spread of natives, etc.)
- Continued incremental management of:
    - Honeysuckle and Black locust (cutting and stump treatment)
    - Blue spruce, scotch pine (cutting and/or girdling)
- Continued Bradley Method:
    - Low-intensity, sustained intervention through many small weedings over a long period; progress can be tracked by monitoring the spread of natives to areas that have been weeded/opened up.

Appendix

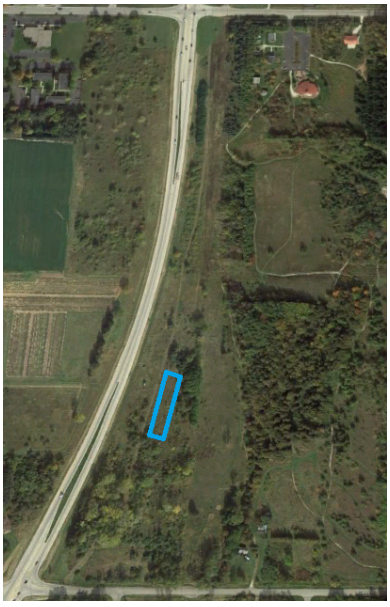
The following images correspond with the goals described in the report. NOTE: shapes and lines are not exact but act as a tool to help visualize and illustrate plans.

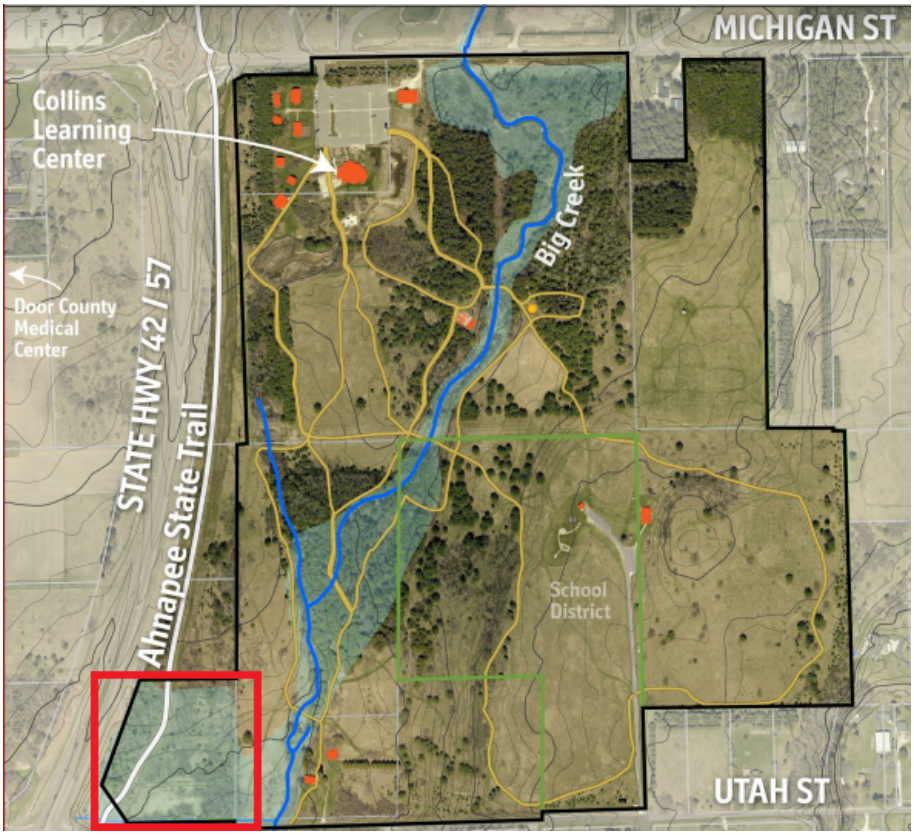
Clockwise starting from upper left: 1) & 1a) blue spruce removal and replacement (blue), 1b) proposed wood margin succession (tan), 1c) proposed bracken grassland (orange), 2) black locust “grove” (red)



Clockwise starting from upper left: 3) proposed pollinator zone (lime green), 4) buckthorn removal (purple), 5) honeysuckle removal and replacement (yellow), 6) potential area for large tree planting (pink)

Clockwise from upper left: 7) potential sedge meadow (blue), location of ATC Corridor (black), mapped wetlands relevant to the restoration site (red)





Invasive species priority lists:

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Resources

Barbe and Fuller, “The Bradley Method of Eliminating Exotic Plants from Natural Preserves”, 2014. http://s3.wp.wsu.edu/uploads/sites/2062/2014/04/bradleytechnique.pdf?x96359

WDNR Plant Communities from: https://dnr.wi.gov/topic/EndangerdResources/communities.asp

Northern Wet-Mesic Forest: https://dnr.wi.gov/topic/EndangeredResources/communities.asp?mode=detail&Code=CPFOR036WI

Shrub-carr: https://dnr.wi.gov/topic/EndangeredResources/communities.asp?mode=detail&Code=CPSHR050WI

Northern Sedge Meadow: https://dnr.wi.gov/topic/EndangeredResources/communities.asp?mode=detail&Code=CPHER060WI

Bracken Grassland: https://dnr.wi.gov/topic/EndangeredResources/communities.asp?mode=detail&Code=CTHER080WI

Native plant decisions informed by:

https://xerces.org/sites/default/files/2018-05/17-047_03_XercesSoc_Pollinator-Plants_Great-Lakes-Region_web-3page_0.pdf

https://wisconsinpollinators.com/Plants/P_WiNativePlants.aspx