



Ecological Assessment Report

Lower Badger Mill Creek Property

City of Madison, Dane County, Wisconsin

October 30, 2023

Project Number: 20231102

Lower Badger Mill Creek Property

City of Madison, Dane County, Wisconsin

October 30, 2023

Prepared for:

Ms. Sarah Lerner, PLA

City of Madison Engineering Division

210 Martin Luther King, Jr. Blvd.

Madison, WI 53703

slerner@cityofmadison.com

Prepared by:

Heartland Ecological Group, Inc.

506 Springdale Street

Mount Horeb, WI 53572

608-490-2450

www.heartlandecological.com



Prepared by: Sarah Kraszewski, Senior
Ecologist



Reviewed by: Scott Fuchs, Environmental
Scientist

Table of Contents

1.0	Introduction	4
2.0	Site Characteristic Assessment.....	5
3.0	Field Assessment Methods.....	6
4.0	Results and Discussion	7
4.1	Existing Conditions.....	7
4.2	Restoration Opportunities.....	10
5.0	Conclusion	11
5.0	References.....	12

Appendix A | Figures

Appendix B | Historic Aerial Imagery

Appendix C | Photographs

Appendix D | Vegetation Lists



1.0 Introduction

Heartland Ecological Group, Inc. (“Heartland”) completed an ecological assessment of the Lower Badger Mill Creek Property on October 2, 2023, at the request of the City of Madison Engineering Division (the “City”). Fieldwork was completed by Sarah Kraszewski, a Senior Ecologist and Professional Wetland Scientist (PWS) at Heartland. The City identified an approximate 38-acre portion of the City’s property as the “Study Area” for this assessment. The Study Area is southeast of the intersection of Meadow Road and Valley View Road, in Section 32, T7N, R8E, City of Madison, Dane County, WI (Figure 1, Appendix A). The Study Area is identified with the following two addresses: 1524 Feather Edge Drive and 1661 Meadow Road.

The City is constructing a flood mitigation project at the Study Area that includes dredging of an existing open water wetland and conversion to a stormwater pond, creation of three stormwater ponds, channel realignment, bridge construction, and sanitary sewer installation. The purpose of the ecological assessment was to identify and evaluate the ecological quality of the plant communities that were not disturbed by the flood mitigation project. The City may use the results of this assessment to guide the restoration planning of the natural communities within the Study Area. This report provides a description of the Study Area based on publicly available resources and historic aerial imagery, assessment methods, a description of the plant communities and floristic quality observed in the field, vegetation lists, representative photographs, and figures depicting the identified plant communities.



2.0 Site Characteristic Assessment

Publicly available resources were utilized including the U.S. Geological Survey's (USGS) *WI 7.5 Minute Series (Topographic) Map* and the WDNR's *24k Hydro Flowlines (Rivers and Streams)* data layer (Figure 2, Appendix A), the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service's (NRCS) Soil Survey Geographic Database (SSURGO) *Web Soil Survey* (Figure 3, Appendix A), and aerial imagery available through the USDA Farm Service Agency's (FSA) National Agriculture Imagery Program (NAIP) and Dane County's Land Information Office (Appendix B).

A review of historic aerial imagery indicates that the Study Area was used for agricultural purposes prior to the 1940s (Appendix B). The 1937 orthophoto depicts the entire Study Area divided into fields for agricultural production with only scattered trees present along some of the field perimeters. Land use conditions appeared relatively consistent until at least 1987. By 1995, three wetland/pond areas appear to have been excavated within the Study Area including a large pond in the northwest portion, a small pond in the southcentral portion, and a large pond in the southeast portion. In 2004 the majority of the Study Area, apart from the ponds, appeared to be in agricultural use and residential developments were constructed to the east of the Study Area. By 2005, it appears that agricultural production was reduced in the northwest portion of the Study Area and a swale became evident within the agricultural field in the northeast portion of the Study Area that may have received surface water flow from the residential development to the east. Conditions appear to have become progressively wetter within the Study Area over time, with surface water visible outside of the ponds in 2010 and 2013 imagery. Agricultural land use continued; however, cropped and hayed areas appeared to get smaller over time and perennial vegetation became established within wetland areas.

The WDNR's *Rivers and Streams* data layer depicts an intermittent waterway that initiates near Meadow Road within the Study Area. This unnamed intermittent waterway has Waterbody Identification Code (WBIC) 5036012 and is a tributary to Badger Mill Creek, which is located approximately 5 miles to the south of the Study Area. The City refers to the waterway as Lower Badger Mill Creek. Based on the topographic map and Dane County one-foot contours, the Study Area appears to be located at a low elevation compared to the



surrounding areas and appears to receive drainage from the west, northeast, and east. Drainage appears to continue to the south of the Study Area along Lower Badger Mill Creek.

Soils within the Study Area consist of a variety of silt loams including Plano (PoB), Troxel (TrB), Radford (RaA), Marshan (Mc), McHenry (Mdc2), and Kegonsa (KeB). The NRCS identifies Marshan silt loam as hydric (100%) and Radford silt loam as predominantly non-hydric (1-15%). The remaining soil types mapped within the Study Area are considered non-hydric.

3.0 Field Assessment Methods

The field assessment was completed via a pedestrian meander survey across the Study Area to identify plant communities that were not disturbed by recent stormwater facility, stream realignment, and/or maintenance path and roadway construction. If multiple areas of a plant community were observed and these areas were determined to have different vegetation composition, these distinct stands were further distinguished by placing a number after the community designation. For example, three different upland meadow communities were identified based on vegetation composition and were described as Upland Meadow 1 (UPL1), Upland Meadow 2 (UPL2), and Upland Meadow 3 (UPL3). Distinct plant community boundaries were mapped using a Global Positioning System (GPS) in the field and then digitized onto recent aerial photography using Geographic Information System (GIS) technology at the office. A plant species list was compiled for each distinct plant community and the cover of each identified species was estimated by assigning a cover class value based on a Modified Braun-Blanquet Cover Class Scale as follows:

Cover Class	1	2	3	4	5	6	7
% Areal Cover	<1%	1-5%	5-10%	10-25%	25-50%	50-75%	75-100%

Representative photographs were taken across the Study Area and wildlife observations were recorded.



Species lists collected during the meander survey were entered into the Universal FQA Calculator (Freyman et al. 2016) using the predetermined Coefficient of Conservatism (C values) and wetland indicator status assigned to each species in the Wisconsin (WDNR) - NCNE Wetland Region (Northern and South-central Wisconsin) FQA database (Chung-Gibson et al. 2017). A Floristic Quality Assessment (FQA) was performed for each distinct plant community. The FQA method is based on calculating the mean C value and species richness to determine a Floristic Quality Index (FQI) for the plant community. C values are assigned to individual plant species based on their tolerance to degradation and the degree to which the species is found in remnant habitats (Freyman et al. 2016). A C value of 0 is applied to a species that demonstrates little fidelity to any remnant natural community; whereas a C value of 10 is applied to plants that are almost always restricted to pre-settlement remnant communities. Values lower than 4 generally represent weedy or common species and values close to 10 represent more conservative, rare, or disturbance intolerant species (Swink and Wilhelm 1994).

$FQI = \text{Mean } C (\sqrt{N})$, where:

C is the Coefficient of Conservatism, and

N is the species richness value.

Non-native species were included in 'All Species' calculations and were assigned a value of zero. The mean C and FQI were calculated for each distinct plant community.

4.0 Results and Discussion

4.1 Existing Conditions

Four wetland community types (degraded wet meadow, hardwood swamp, shrub-carr, and seasonally flooded basin) and three upland community types (old field, upland meadow, and upland woodland) were identified and described within the Study Area. Plant communities are depicted on Figure 4 and the approximate acreage of each plant community is provided in the figure legend (Appendix A). Plant communities are summarized in Table 1 below. Representative photographs were taken from photo points depicted on Figure 4 and are provided in Appendix C. Species lists and FQA metrics for each distinct plant community are



provided in Appendix D. Plant community types that had multiple distinct vegetation assemblages are distinguished with numbers on Figure 4 that correspond to the species list name in Appendix D (e.g., Upland Meadow 1, 2, 3, etc.).

Areas that had been recently seeded, matted, or otherwise disturbed by stormwater facility construction are not depicted as a plant community on Figure 4. The constructed stormwater pond perimeters, approximate maintenance path locations, bridge, and the Lower Badger Mill Creek alignment depicted on Figure 4 were taken from the City’s CAD data, which was provided to Heartland. Additional features shown on Figure 4 include a mowed path in the northeastern portion of the Study Area, an old spoil pile with tree growth, and a parking lot utilized by an adjacent business in the southwest portion.

Table 1. Plant Community Summary

Plant Community	Dominant Species	General Notes
Degraded Wet Meadow	Reed canary grass	Low quality herbaceous wetland that lacks seasonal ponding, found across the Study Area
Hardwood Swamp 1 (HS1)	Eastern cottonwood, sandbar willow, and reed canary grass	Small wooded wetland in northern portion of Study Area
Hardwood Swamp 2 (HS2)	River birch, Bell’s honeysuckle, and reed canary grass	Small wooded wetland in eastern portion of Study Area
Shrub-Carr	Sandbar willow, reed canary grass, and eastern cottonwood	Small sandbar willow dominated wetland
Seasonally Flooded Basin 1 (SFB1)	Pennsylvania knotweed	Historically excavated ponds in the northern and southern portions of Study Area that appear to be seasonally ponded and dominated by annual species. The southern basin appears to have long durations of open water.
Seasonally Flooded Basin 2 (SFB2)	Rice cut grass	Historically excavated pond in southwest portion of Study Area that appears to be seasonally ponded
Old Field	Fall panic grass and giant foxtail	Fallow agricultural field along eastern perimeter of Study Area with weedy vegetation establishment
Upland Meadow 1 (UPL1)	Reed canary grass and Canada goldenrod	Three upland meadow areas in northwestern portion of Study Area



Plant Community	Dominant Species	General Notes
Upland Meadow 2 (UPL2)	Canada goldenrod, crown vetch, reed canary grass, globular coneflower, and black locust	Upland meadow in northeastern portion of Study Area with scattered native prairie species present but overall dominated by invasive species including black locust saplings in northern portion. Mowed path down center.
Upland Meadow 3 (UPL3)	Orchard grass, Queen Anne’s lace, fescue, crown vetch, and Canada goldenrod	Upland meadow in southwestern portion of Study Area, dominated by Eurasian cool season grasses and non-native forbs
Upland Woodland	Bell’s honeysuckle, black locust, box elder, silver maple, black walnut, and orchard grass	Disturbed upland woodlands. Southwestern community contains areas of prior upland meadow that have been encroached by black locust.

No remnant or high-quality plant communities were observed within the Study Area, which was anticipated given the history of agricultural land use. Overall, plant communities within the Study Area were low quality based on low native species richness and cover and were degraded by non-native and invasive species (Appendix D). Although several native prairie species were observed in Upland Meadow 2, the dominance of invasive species such as crown vetch and black locust have negatively impacted the floristic and habitat quality. The stand of river birch within Hardwood Swamp 2 is desirable; however, there are few other native species present in the forested wetland and surrounding areas. The Upland Woodland community in the southwest corner does contain scattered native species; however, the overall wooded area is not representative of a natural community and is extensively degraded by invasive shrubs and herbaceous species.

Wildlife and signs of wildlife observed while conducting the meander surveys included small mammals, white-tailed deer, and frogs. Observed insects included grasshoppers and monarch butterflies. Observed birds included killdeer, Canada geese, gray catbirds, blue jays, black-capped chickadees, sparrows, rock doves, mallards, great blue heron, and wood ducks. Canada geese were primarily observed within the newly constructed stormwater ponds and the rock doves were observed around the newly constructed pond slopes. The large seasonally flooded basin in the southern portion of the Study Area (SFB1) appears to



provide good waterfowl habitat within open water areas. This area likely supports migrating waterfowl, provides amphibian habitat, and provides a water source for other wildlife.

4.2 Restoration Opportunities

Although the existing plant communities are generally low quality, there are restoration opportunities throughout the Study Area to enhance wildlife and pollinator habitat, improve floristic quality, enhance the restoration of Lower Badger Mill Creek, and improve aesthetics for the adjacent landowners and property users. These enhancements and restoration opportunities will become increasingly more important as the surrounding landscape is developed for residential use. The areas of greatest wildlife habitat potential appear to be the seasonally flooded basins, particularly the large basin in the southern portion of the Study Area that has open water components for much of the growing season. Habitat could be further enhanced by restoring the degraded wet meadow areas around the seasonally flooded basins to native wet meadow/wet prairie vegetation. These communities would provide native perennial cover with a diversity of wildflowers to attract insects and graminoids that provide nesting habitat and cover. Encouraging a diversity of insects will provide food sources for birds, frogs, and bats. Restoring the adjacent wetland areas will also improve habitat for birds and amphibians. Structures such as sunning logs for turtles could be added to areas that frequently have open water.

It is recommended that invasive trees and shrubs be removed across the Study Area, including black locust, common buckthorn, and invasive bush honeysuckle. Upland meadow and old field areas that will not be impacted by future road construction are suitable for prairie restoration following removal of existing vegetation and invasive species control. Shortgrass prairie plantings could provide an aesthetically pleasing landscape along the future roads and bike paths, buffer the adjacent wetland areas with deep-rooted perennials that would assist with infiltration, and provide nesting habitat and food sources for small birds and pollinators. Woodland areas can be enhanced by controlling invasive species and adding additional native species to improve floristic diversity and habitat. Plant community restoration should be assessed comprehensively with the restoration of the newly constructed stormwater facilities.



5.0 Conclusion

Heartland completed an ecological assessment at the Lower Badger Mill Creek Property on October 2, 2023, to assess areas not impacted or disturbed by recent flood mitigation project work. The ecological assessment was completed on behalf of the City of Madison Engineering Division. The Study Area was historically used for agricultural purposes and had been entirely cleared of natural plant communities prior to the 1940s.

Four wetland plant communities and three upland plant communities were identified and assessed. Overall, the plant communities had low floristic quality and were dominated by non-native and invasive species. Although the floristic quality of the plant communities was low, the Study Area is currently providing wildlife habitat which can be further enhanced by removing invasive species and restoring native plant communities such as wet meadow, wet prairie, and shortgrass upland prairie. Restoration of native plant communities may improve floristic quality, storm and floodwater storage, aquatic life and wildlife habitat, and human use values in a landscape that is being rapidly developed for residential use.



5.0 References

Chung-Gibson, M., T. Bernthal, K. Doyle, M. Wetter, and E. Haber. 2017. Wisconsin FQA (Floristic Quality Assessment) Database for Wisconsin – NCNE Wetland Region (Northern and South-central Wisconsin) for Universal FQA Calculator Website. Accessed October 2023 from: <http://universalfqa.org/>.

Dane County Land Information Office. (1937, 1955, 1976, 1987, 1995). [Dane County, Wisconsin aerial photographs]. Accessed October 2023 from: <https://lio.countyofdane.com/>.

Freyman, W.A., L.A. Masters, and S. Packard. 2016. The Universal Floristic Quality Assessment (FQA) Calculator: an online tool for ecological assessment and monitoring. *Methods in Ecology and Evolution* 7(3): 380-383.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (USDA). (2018). *Soil Survey Geographic (SSURGO) Database*. See: <http://websoilsurvey.nrcs.usda.gov/> or <http://datagateway.nrcs.usda.gov/>.

Soil Survey Staff, Natural Resources Conservation Service, USDA. (2018). *Web Soil Survey*. See: <http://websoilsurvey.nrcs.usda.gov/>.

Swink, F. and G. Wilhelm. 1994. *Plants of the Chicago Region*. 4th ed. Indiana Academy of Science, Indianapolis.

United States Department of Agriculture (USDA), Farm Service Agency (FSA). (2004, 2005, 2006, 2008, 2010, 2013, 2015, 2017, 2018, 2020, 2022) [Dane County, Wisconsin aerial photographs]. National Agriculture Imagery Program (NAIP). Salt Lake City, UT: Aerial Photography Field Office.

United States Department of the Interior (USDI), U.S. Geological Survey (USGS). *Wisconsin 7.5 Minute Series (Topographic) Maps*. 1:24,000. Reston, VA.

WDNR, Open Data Portal. (2023). [24k Hydro Flowlines (Rivers and Streams)]. See: <https://data-wi-dnr.opendata.arcgis.com/>.



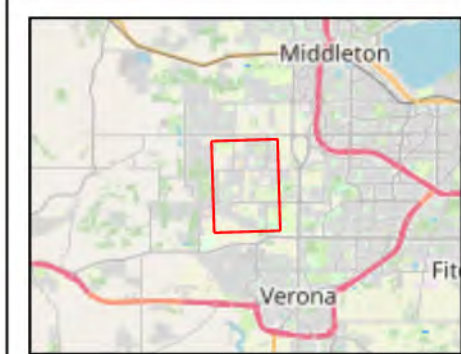
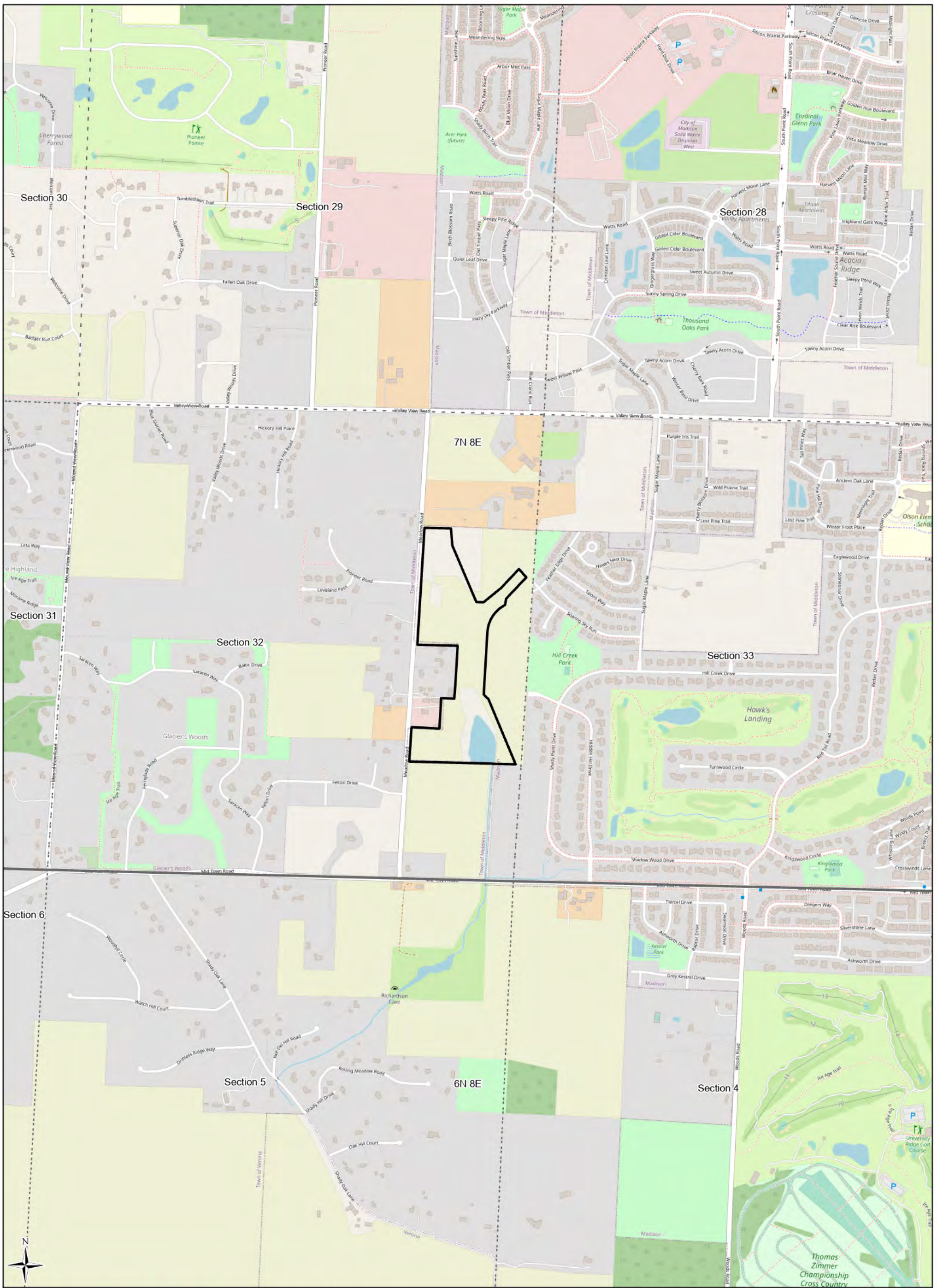
Appendix A | Figures

Figure 1. Project Location

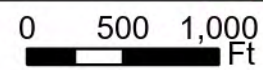
Figure 2. USGS Topography

Figure 3. NRCS Hydric Soils

Figure 4. Existing Plant Communities



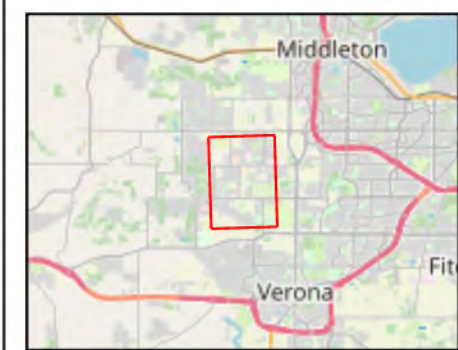
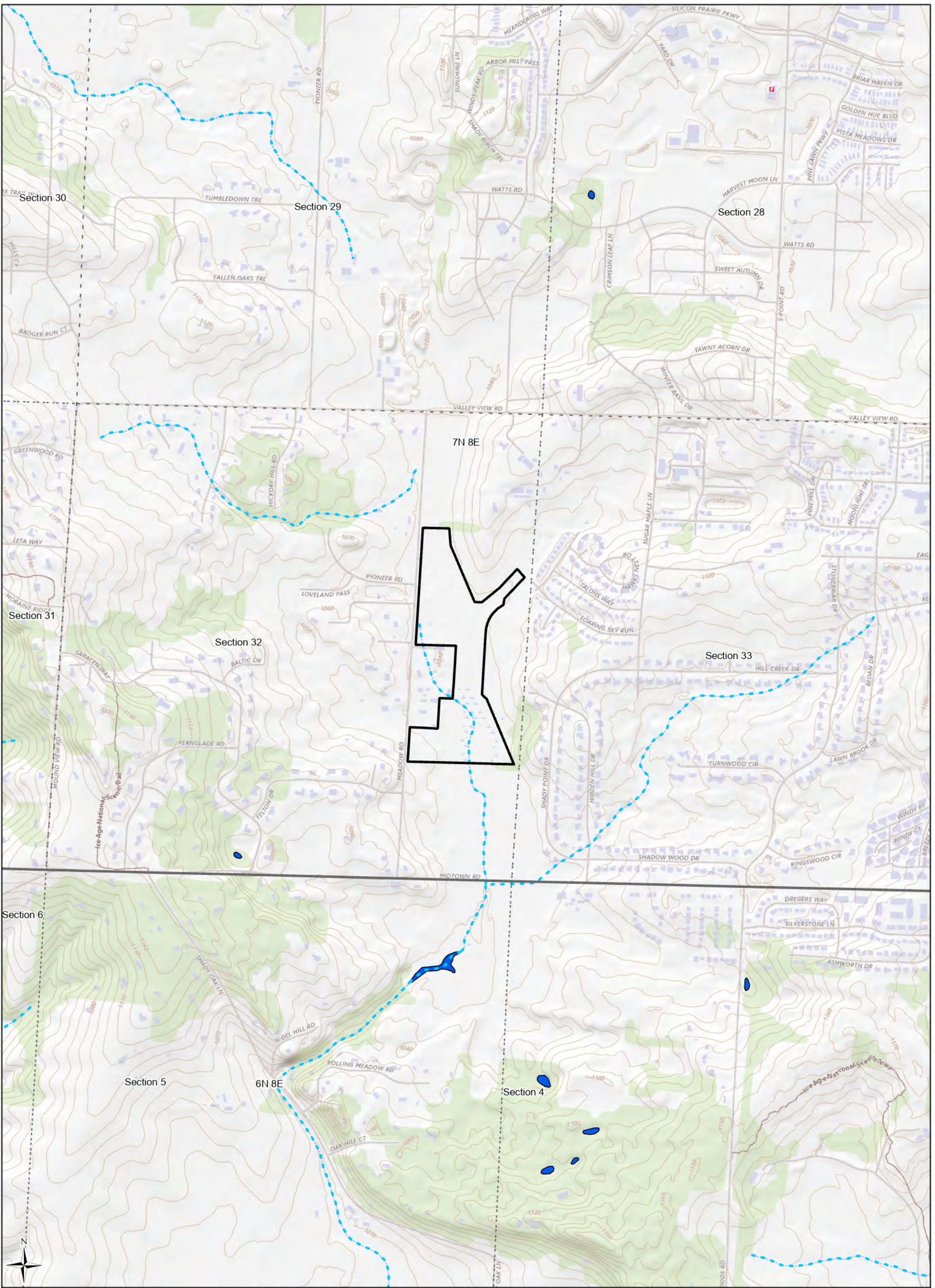
- Study Area (38.35 ac)
- Township
- Section



Heartland
ECOLOGICAL GROUP INC

Figure 1. Project Location
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

OpenStreetMap
ESRI
LRR: NCNE
Figure Created: 9/22/2023



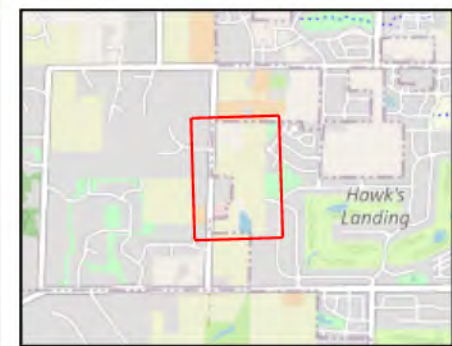
- Study Area (38.35 ac)
- Township
- Section
- Perennial Streams (None in Map Extent)
- Intermittent Streams
- Waterbodies

0 500 1,000
Ft

Heartland
ECOLOGICAL GROUP INC

Figure 2. USGS
Topography
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

USGSTopo
USGS, WDNR
LRR: NCNE
Figure Created: 10/25/2023



- Study Area (38.35 ac)
- NRCS Soil Survey Data**
- Hydric (100%)
 - Predominantly Hydric (85-99%)
 - Partially Hydric (16-84%)
 - Predominantly Non-Hydric (1-15%)
 - Non-Hydric (0%)



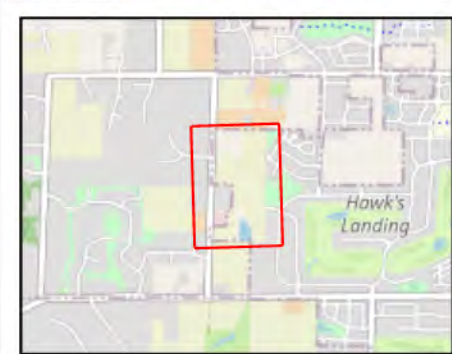
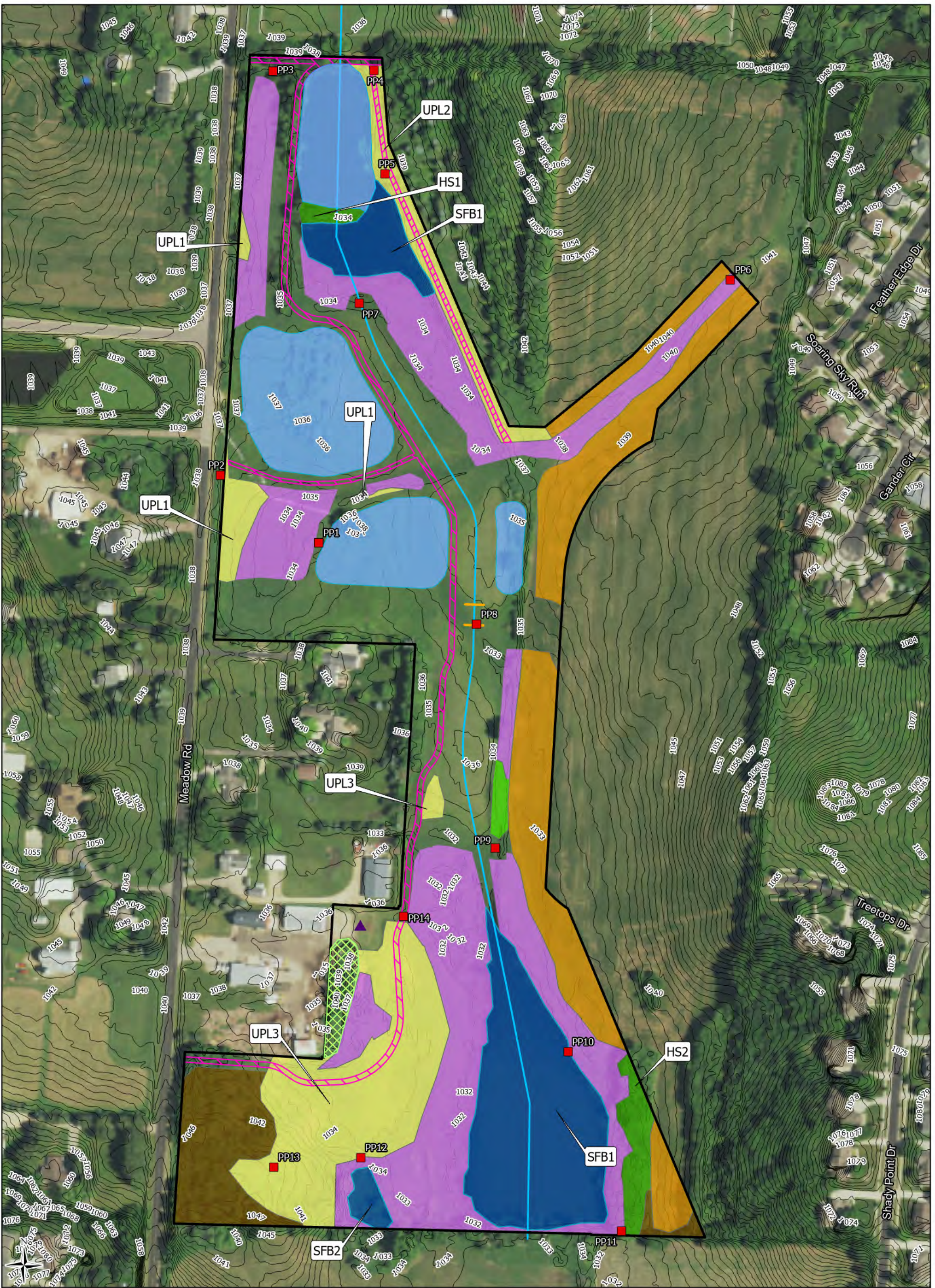
Heartland
ECOLOGICAL GROUP INC

Figure 3. NRCS Hydric Soils
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2020 NAIP
NRCS

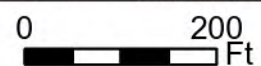
LRR: NCNE

Figure Created: 10/25/2023



- Study Area (38.35 ac)
- Dane Co 1' Contours
- Photo Points
- Storm Water Ponds (4.65 ac)
- Spoil Pile (0.30 ac)
- Maintenance Paths
- Mowed Path
- ▲ Parking Lot
- ~ Lower Badger Mill Creek Alignment
- Bridge

- Upland Communities**
- Upland Meadow (4.85 ac)
- Old Field (3.91 ac)
- Upland Woodland (1.63 ac)
- Wetland Communities**
- Degraded Wet Meadow (8.48 ac)
- Hardwood Swamp (0.59 ac)
- Shrub-Carr (0.13 ac)
- Seasonally Flooded Basin (4.28 ac)



Heartland
ECOLOGICAL GROUP INC

Figure 4. Existing Plant Communities
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co


2022 NAIP
Dane Co, HEG
LRR: NCNE
Figure Created: 10/26/2023



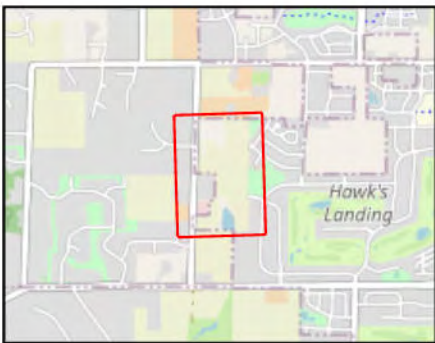
City of Madison Engineering Division
Lower Badger Mill Creek Property
Project #: 20231102
October 30, 2023

Appendix B | Historic Aerial Imagery



 Study Area (38.35 ac)

0 200
Ft




Heartland
ECOLOGICAL GROUP INC

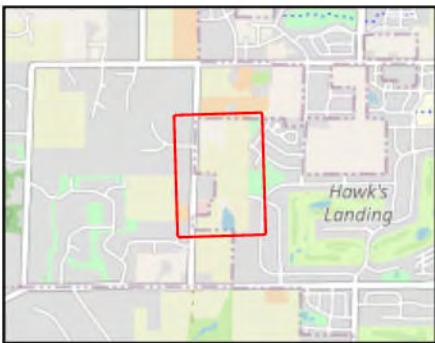
Appendix: 1937
Dane Co Orthophoto
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

1937 Orthophoto
Dane Co. LIO LRR: NCNE
Figure Created: 10/30/2023



 Study Area (38.35 ac)

0 200
Ft

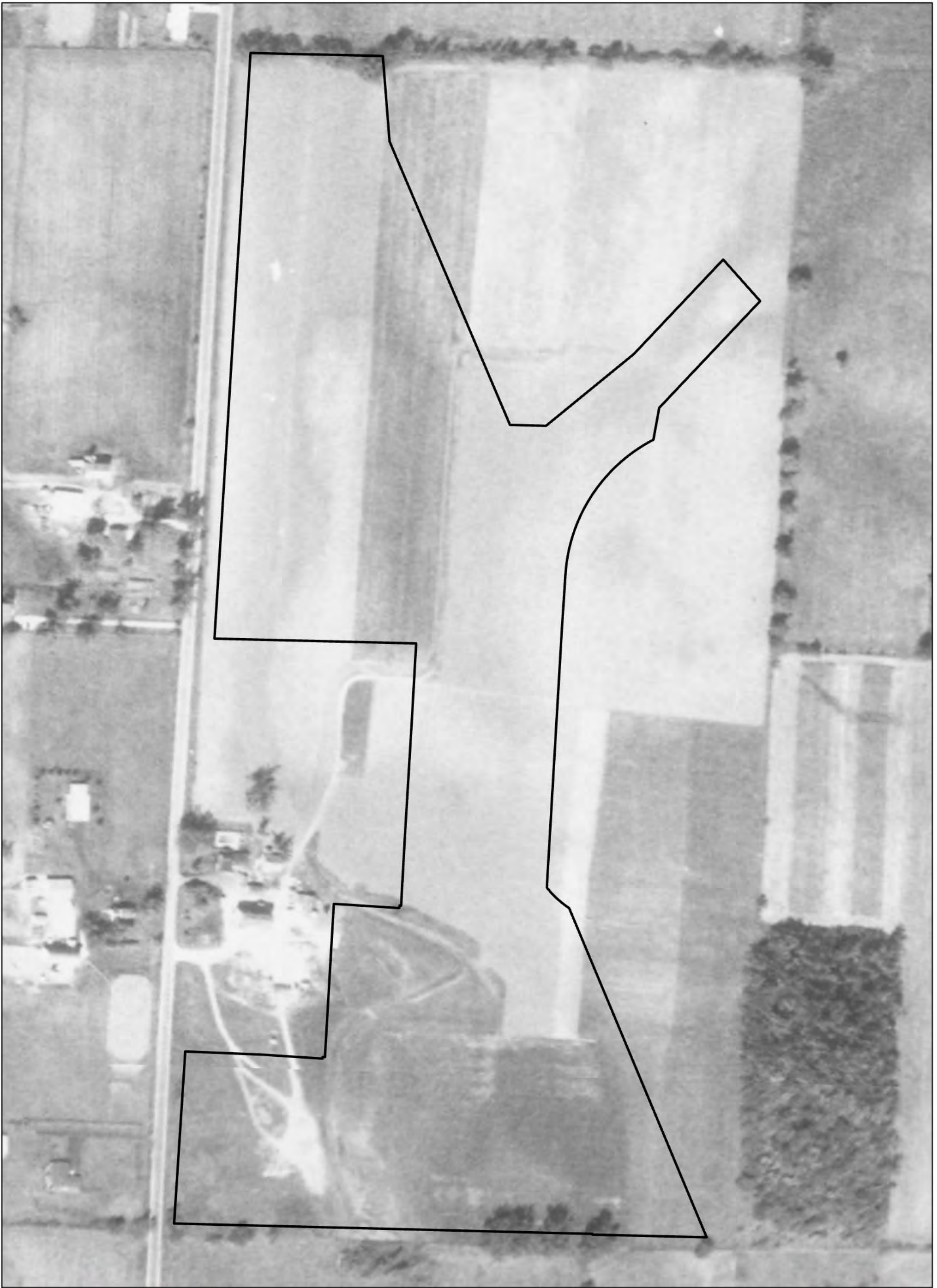



Heartland
ECOLOGICAL GROUP INC

Appendix: 1955
Dane Co Orthophoto
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

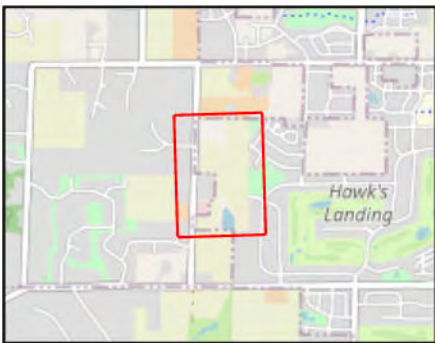
1955 Orthophoto
Dane Co. LIO LRR: NCNE

Figure Created: 10/30/2023



 Study Area (38.35 ac)

0 200
Ft




Heartland
ECOLOGICAL GROUP INC

Appendix: 1976
Dane Co Orthophoto
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

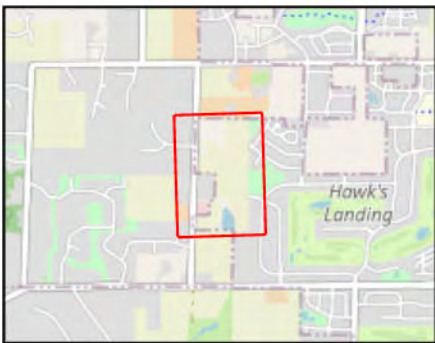
1976 Orthophoto
Dane Co. LIO LRR: NCNE

Figure Created: 10/30/2023



 Study Area (38.35 ac)

0 200
Ft



Heartland
ECOLOGICAL GROUP INC

Appendix: 1987
Dane Co Orthophoto
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

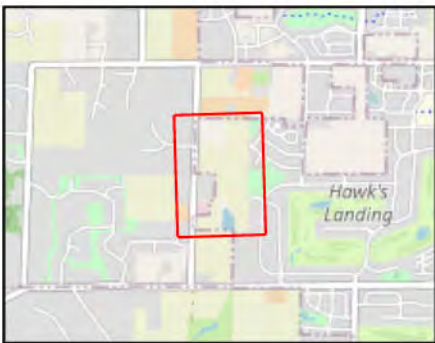
1987 Orthophoto
Dane Co. LIO LRR: NCNE

Figure Created: 10/30/2023



Study Area (38.35 ac)

0 200 Ft



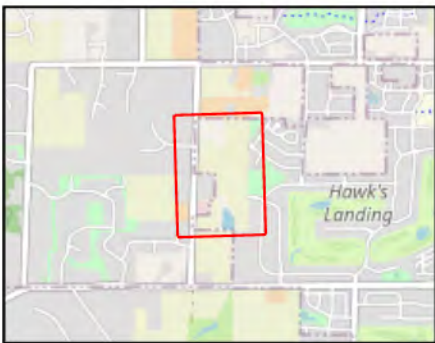
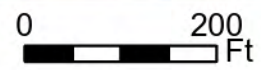
Heartland
ECOLOGICAL GROUP INC

Appendix: 1995
Dane Co Orthophoto
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

1995 Orthophoto
Dane Co. LIO LRR: NCNE
Figure Created: 10/30/2023



Study Area (38.35 ac)



Heartland
ECOLOGICAL GROUP INC

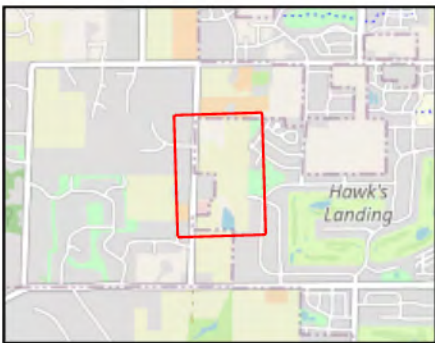
Appendix: 2004-07-15
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2004 NAIP
USDA
LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)

0 200 Ft



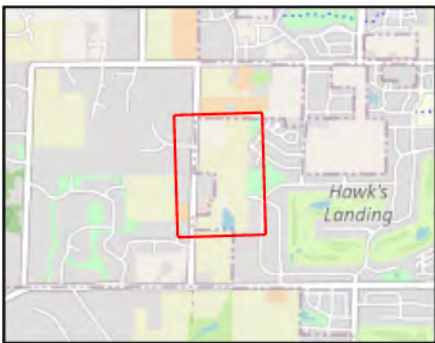
Heartland
ECOLOGICAL GROUP INC

Appendix: 2005-07-08
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2005 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)



Heartland
ECOLOGICAL GROUP INC

Appendix: 2006-07-15
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

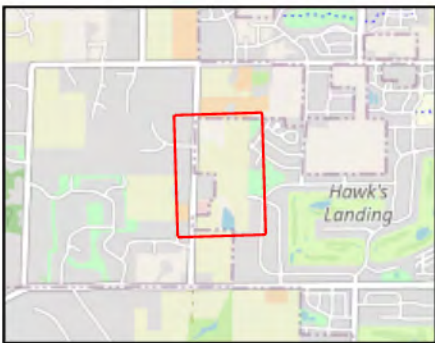
2006 NAIP
USDA
LRR: NCNE

Figure Created: 9/22/2023



 Study Area (38.35 ac)

0 200
Ft



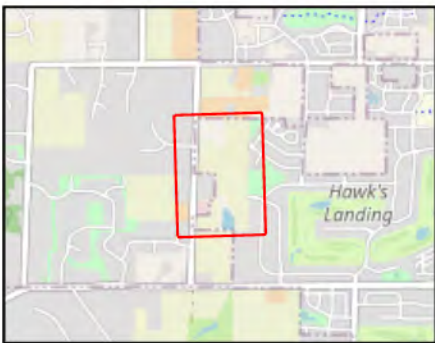
Heartland
ECOLOGICAL GROUP INC

Appendix: 2008-07-09
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2008 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)



Heartland
ECOLOGICAL GROUP INC

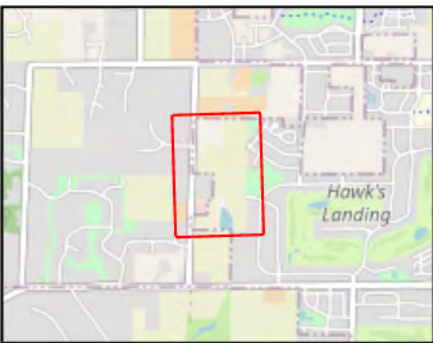
Appendix: 2010-07-02
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2010 NAIP
USDA
LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)

0 200 Ft

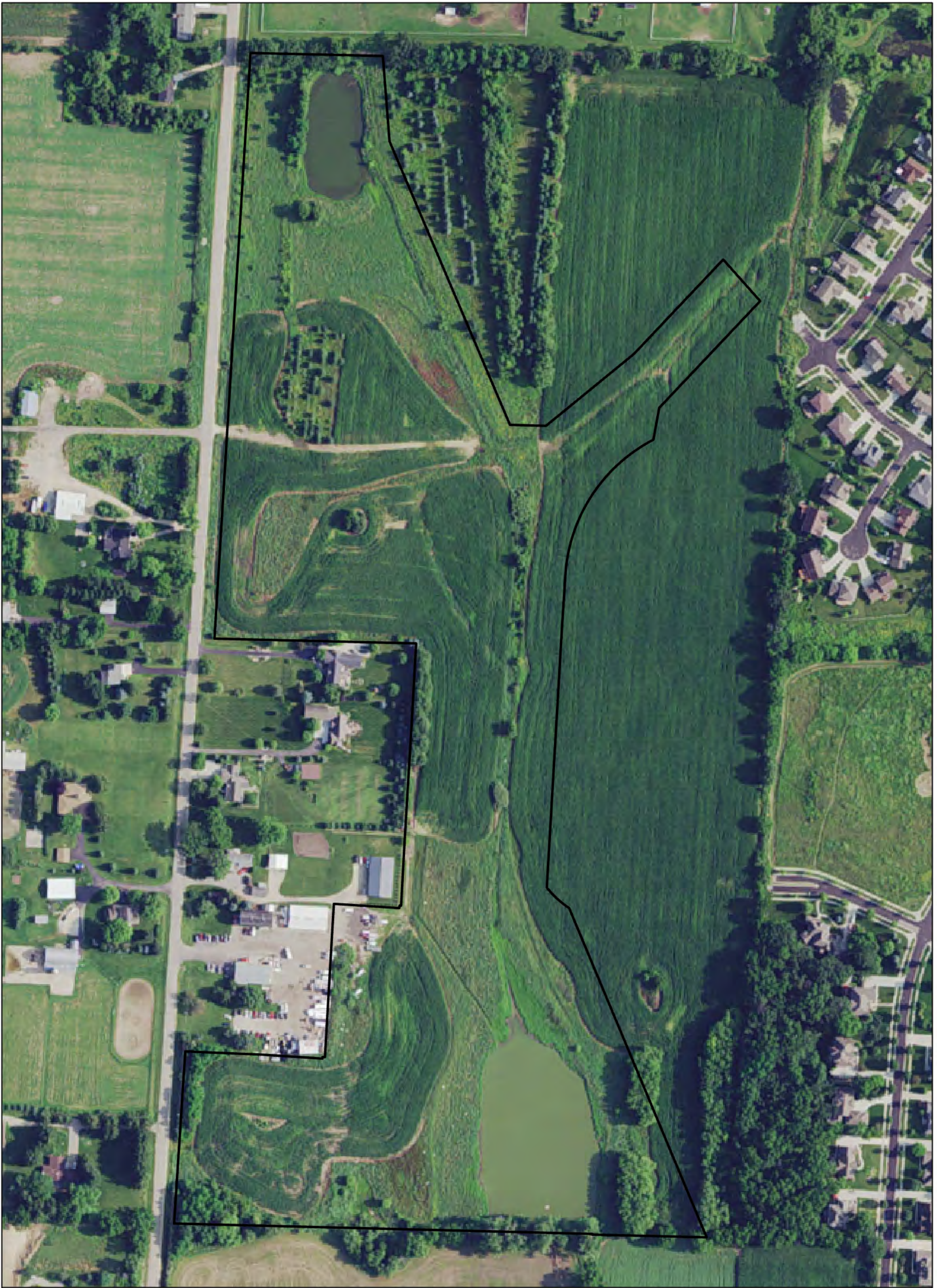


Heartland
ECOLOGICAL GROUP INC

Appendix: 2013-07-04
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

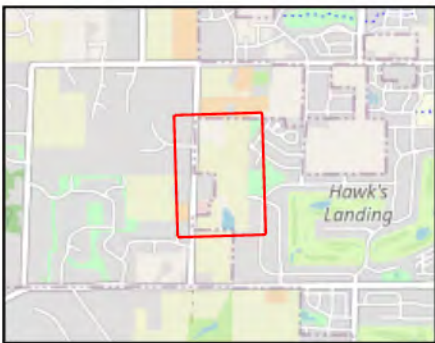
2013 NAIP
USDA LRR: NCNE

Figure Created: 9/22/2023



Study Area (38.35 ac)

0 200 Ft



Heartland
ECOLOGICAL GROUP INC

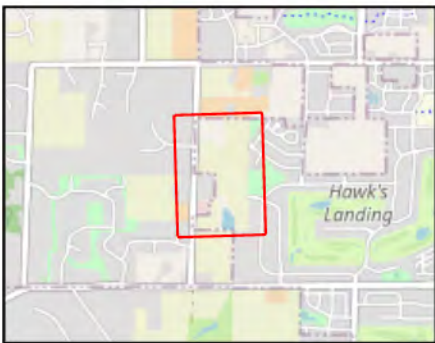
Appendix: 2015-07-10
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2015 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)

0 200 Ft



Heartland
ECOLOGICAL GROUP INC

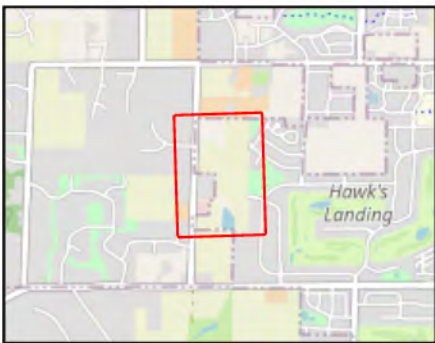
Appendix: 2017-09-03
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2017 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)

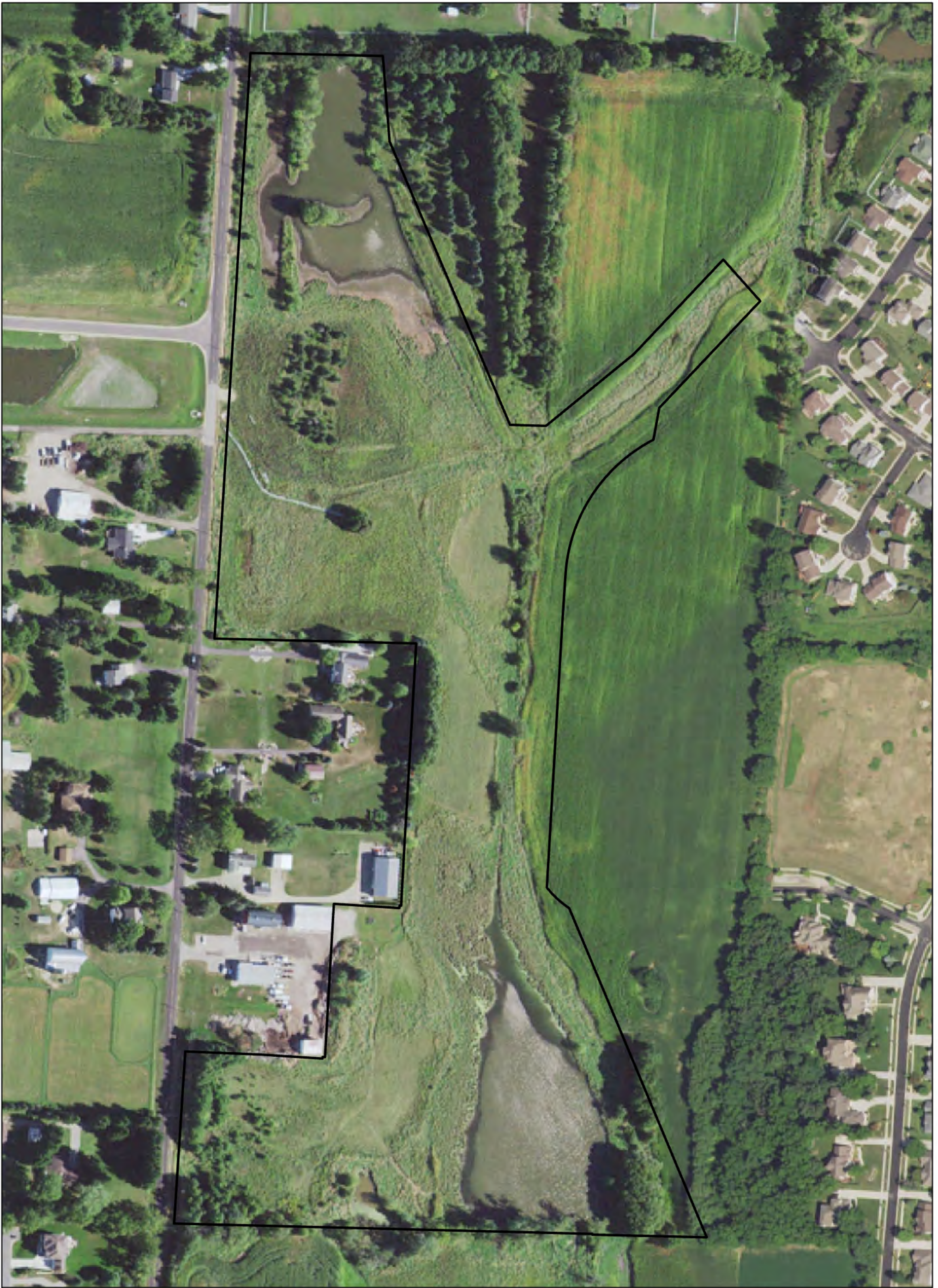
0 200 Ft



Heartland
ECOLOGICAL GROUP INC

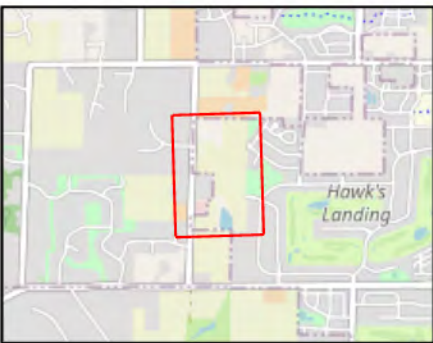
Appendix: 2018-07-28
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2018 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



Study Area (38.35 ac)

0 200 Ft



Heartland
ECOLOGICAL GROUP INC

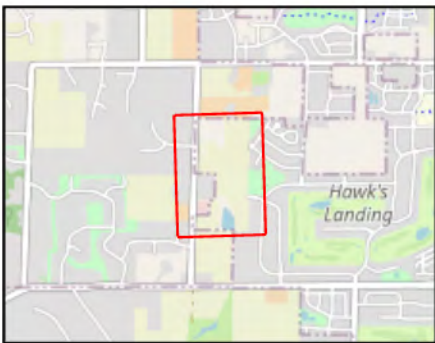
Appendix: 2020-08-29
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2020 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



 Study Area (38.35 ac)

0 200
Ft



Heartland
ECOLOGICAL GROUP INC

Appendix: 2022-06-26
NAIP Aerial Imagery
Lower Badger Mill Creek
Project #20231102
T7N, R8E, S32
C Madison, Dane Co

2022 NAIP
USDA LRR: NCNE
Figure Created: 9/22/2023



City of Madison Engineering Division
Lower Badger Mill Creek Property
Project #: 20231102
October 30, 2023

Appendix C | Photographs



Photo #1 Photo point 1, view north of degraded wet meadow



Photo #2 Photo point 1, view east toward stormwater pond



Photo #3 Photo point 1, view south of stormwater pond slope (left) and degraded wet meadow (right)



Photo #4 Photo point 1, view west of degraded wet meadow with upland meadow (UPL1) in background



Photo #5 Photo point 2, view north along Meadow Road ROW and newly seeded stormwater pond perimeter



Photo #6 Photo point 2, view east along maintenance path



Photo #7 Photo point 2, view south of upland meadow (UPL1)



Photo #8 Photo point 2, view southeast along recently restored path perimeter and upland meadow (UPL1)



Photo #9 Photo point 3, view south of degraded wet meadow and shrubby ROW along Meadow Road



Photo #10 Photo point 3, view southeast along maintenance path perimeter and degraded wet meadow



Photo #11 Photo point 3, view east along maintenance path at northwest corner of the Study Area



Photo #12 Photo point 4, view south along upland meadow (UPL2) with black locust saplings



Photo #13 Photo point 5, view north of upland meadow (UPL2) above stormwater pond (to left)



Photo #14 Photo point 5, view south toward seasonally flooded basin (SFB1)



Photo #15 Photo point 5, view southwest of stormwater pond with hardwood swamp (HS1) in background



Photo #16 Photo point 6, view SSW along mowed degraded wet meadow with old field along the perimeters



Photo #17 Photo point 7, view NNW of degraded wet meadow with SFB1 and HS1 in background



Photo #18 Photo point 7, view SSE along constructed swale for Lower Badger Mill Creek



Photo #19 Photo point 8, view northwest from bridge



Photo #20 Photo point 8, view northeast from bridge



Photo #21 Photo point 8, view southeast from bridge along Lower Badger Mill Creek



Photo #22 Photo point 9, view north towards shrub-carr



Photo #23 Photo point 9, view east in recently disturbed stormwater utility corridor with old field in background



Photo #24 Photo point 9, view south along eastern bank of Lower Badger Mill Creek



Photo #25 Photo point 9, view west across Lower Badger Mill Creek



Photo #26 Photo point 10, view north along transition from seasonally flooded basin to degraded wet meadow



Photo #27 Photo point 10, view east of degraded wet meadow with hardwood swamp in background



Photo #28 Photo point 10, view south of seasonally flooded basin with ponding



Photo #29 Photo point 10, view west of seasonally flooded basin



Photo #30 Photo point 11, view north along perimeter of degraded wet meadow and hardwood swamp (HS2)



Photo #31 Photo point 11, view northwest toward seasonally flooded basin from south edge of Study Area



Photo #32 Photo point 12, view south of seasonally flooded basin (SFB2)



Photo #33 Photo point 12, view north of upland meadow (UPL3)



Photo #34 Photo point 12, view east of upland meadow (UPL3, left) and degraded wet meadow (right)



Photo #35 Photo point 13, view north from upland meadow (UPL3) toward upland woodland



Photo #36 Photo point 13, view northeast of upland meadow (UPL3)

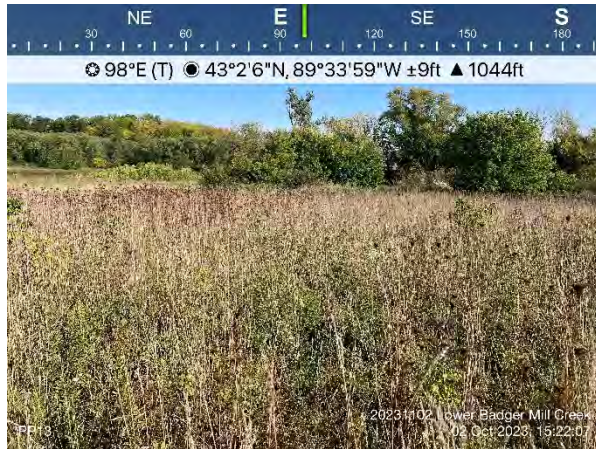


Photo #37 Photo point 13, view east of upland meadow (UPL3)



Photo #38 Photo point 13, view west from upland meadow (UPL3) toward upland woodland



Photo #39 Photo point 14, view north along maintenance path along western Study Area perimeter



Photo #40 Photo point 14, view east towards degraded wet meadow



Photo #41 Photo point 14, view south along maintenance path



Photo #42 Photo point 14, view WSW toward area of encroachment by adjacent business



Appendix D | Vegetation Lists

Table D-1. Degraded Wet Meadow Species List

Table D-2. Hardwood Swamp 1 (HS1) Species List

Table D-3. Hardwood Swamp 2 (HS2) Species List

Table D-4. Shrub-Carr Species List

Table D-5. Seasonally Flooded Basin 1 (SFB1) Species List

Table D-6. Seasonally Flooded Basin 2 (SFB2) Species List

Table D-7. Old Field Species List

Table D-8. Upland Meadow 1 (UPL1) Species List

Table D-9. Upland Meadow 2 (UPL2) Species List

Table D-10. Upland Meadow 3 (UPL3) Species List

Table D-11. Upland Woodland Species List

Table D-1. Degraded Wet Meadow Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Abutilon theophrasti</i>	piemarker	non-native	forb	0	FACU	2
<i>Acer negundo</i>	box elder	native	tree	0	FAC	1
<i>Acer saccharinum</i>	silver maple	native	tree	2	FACW	2
<i>Agrostis gigantea</i>	redtop	non-native	grass	0	FACW	2
<i>Ambrosia artemisiifolia</i>	annual bur-sage	native	forb	0	FACU	2
<i>Ambrosia trifida</i>	giant ragweed	native	forb	0	FAC	1
<i>Betula nigra</i>	river birch	native	tree	6	FACW	1
<i>Bolboschoenus fluviatilis</i>	river bulrush	native	sedge	6	OBL	2
<i>Chenopodium simplex</i>	maple-leaved goosefoot	native	forb	1	UPL	1
<i>Cyperus esculentus</i>	field nut sedge	native	sedge	0	FACW	2
<i>Echinochloa crus-galli</i>	barnyard grass	non-native	grass	0	FAC	2
<i>Euthamia graminifolia</i>	common flat-topped goldenrod	native	forb	4	FAC	1
<i>Festuca arundinacea</i>	reed fescue	non-native	grass	0	FACU	2
<i>Fraxinus pennsylvanica</i>	green ash	native	tree	2	FACW	1
<i>Lonicera x bella</i>	Bell's honeysuckle	non-native	shrub	0	FACU	1
<i>Panicum dichotomiflorum</i>	fall panic grass	native	grass	0	FACW	2
<i>Persicaria lapathifolia</i>	curly-top knotweed	native	forb	2	FACW	1
<i>Persicaria maculosa</i>	heart's-ease	non-native	forb	0	FAC	1
<i>Persicaria pennsylvanica</i>	Pennsylvania knotweed	native	forb	1	FACW	1
<i>Persicaria punctata</i>	dotted smartweed	native	forb	5	OBL	1
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	7
<i>Populus deltoides</i>	eastern cottonwood	native	tree	2	FAC	1
<i>Salix eriocephala</i>	diamond willow	native	shrub	4	FACW	1
<i>Salix interior</i>	sandbar willow	native	shrub	2	FACW	1
<i>Salix petiolaris</i>	meadow willow	native	shrub	6	FACW	2
<i>Scirpus cyperinus</i>	wool-grass	native	sedge	4	OBL	2
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	3
<i>Trifolium hybridum</i>	alsike clover	non-native	forb	0	FACU	1
<i>Vitis riparia</i>	frost grape	native	vine	2	FAC	1

FQA Metrics	Species Richness	Mean C Value	FQI
Native	21	2.4	11.0
All Species	29	1.7	9.2

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-2. Hardwood Swamp 1 (HS1) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Asclepias syriaca</i>	common milkweed	native	forb	1	UPL	2
<i>Asclepias verticillata</i>	whorled milkweed	native	forb	2	UPL	1
<i>Bromus inermis</i>	Hungarian brome	non-native	grass	0	UPL	2
<i>Carex vulpinoidea</i>	brown fox sedge	native	sedge	2	OBL	1
<i>Juniperus virginiana</i>	eastern red-cedar	native	tree	3	FACU	2
<i>Lonicera x bella</i>	Bell's honeysuckle	non-native	shrub	0	FACU	3
<i>Melilotus officinalis</i>	yellow sweet-clover	non-native	forb	0	FACU	2
<i>Persicaria pensylvanica</i>	Pennsylvania knotweed	native	forb	1	FACW	2
<i>Persicaria punctata</i>	dotted smartweed	native	forb	5	OBL	2
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	5
<i>Poa pratensis</i>	Kentucky bluegrass	non-native	grass	0	FACU	2
<i>Populus deltoides</i>	eastern cottonwood	native	tree	2	FAC	6
<i>Rhamnus cathartica</i>	common buckthorn	non-native	shrub	0	FAC	2
<i>Rubus idaeus var. strigosus</i>	American red raspberry	native	shrub	3	UPL	1
<i>Rumex crispus</i>	curly dock	non-native	forb	0	FAC	2
<i>Salix interior</i>	sandbar willow	native	shrub	2	FACW	5
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	3
<i>Symphotrichum novae-angliae</i>	New England aster	native	forb	3	FACW	3
<i>Symphotrichum pilosum</i>	frost aster	native	forb	1	FACU	2
<i>Vitis riparia</i>	frost grape	native	vine	2	FAC	2

FQA Metrics	Species Richness	Mean C Value	FQI
Native	13	2.2	7.9
All Species	20	1.4	6.3

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-3. Hardwood Swamp 2 (HS2) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Betula nigra</i>	river birch	native	tree	6	FACW	6
<i>Juglans nigra</i>	black walnut	native	tree	3	FACU	3
<i>Lonicera x bella</i>	Bell's honeysuckle	non-native	shrub	0	FACU	6
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	4

FQA Metrics	Species Richness	Mean C Value	FQI
Native	2	4.5	6.4
All Species	4	2.3	4.6

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-4. Shrub-Carr Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	6
<i>Populus deltoides</i>	eastern cottonwood	native	tree	2	FAC	4
<i>Salix interior</i>	sandbar willow	native	shrub	2	FACW	6

FQA Metrics	Species Richness	Mean C Value	FQI
Native	2	2.0	2.8
All Species	3	1.3	2.3

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-5. Seasonally Flooded Basin 1 (SFB1) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Abutilon theophrasti</i>	piemarker	non-native	forb	0	FACU	2
<i>Bidens cernua</i>	nodding beggar-ticks	native	forb	4	OBL	2
<i>Echinochloa crus-galli</i>	barnyard grass	non-native	grass	0	FAC	3
<i>Persicaria lapathifolia</i>	curly-top knotweed	native	forb	2	FACW	3
<i>Persicaria pensylvanica</i>	Pennsylvania knotweed	native	forb	1	FACW	7
<i>Persicaria punctata</i>	dotted smartweed	native	forb	5	OBL	2
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	3
<i>Rorippa palustris</i>	bog yellow-cress	native	forb	3	OBL	2
<i>Rumex crispus</i>	curly dock	non-native	forb	0	FAC	3

FQA Metrics	Species Richness	Mean C Value	FQI
Native	5	3.0	6.7
All Species	9	1.7	5.1

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-6. Seasonally Flooded Basin 2 (SFB2) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Alisma subcordatum</i>	American water-plantain	native	forb	3	OBL	1
<i>Bidens cernua</i>	nodding beggar-ticks	native	forb	4	OBL	2
<i>Bolboschoenus fluviatilis</i>	river bulrush	native	sedge	6	OBL	3
<i>Echinochloa crus-galli</i>	barnyard grass	non-native	grass	0	FAC	4
<i>Erechtites hieraciifolius</i>	American burn-weed	native	forb	2	FACU	2
<i>Impatiens capensis</i>	orange jewelweed	native	forb	2	FACW	1
<i>Leersia oryzoides</i>	rice cut grass	native	grass	3	OBL	7
<i>Panicum dichotomiflorum</i>	fall panic grass	native	grass	0	FACW	4
<i>Persicaria pensylvanica</i>	Pennsylvania knotweed	native	forb	1	FACW	2
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	4

FQA Metrics	Species Richness	Mean C Value	FQI
Native	8	2.6	7.4
All Species	10	2.1	6.6

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-7. Old Field Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Abutilon theophrasti</i>	piemarker	non-native	forb	0	FACU	2
<i>Amaranthus tuberculatus</i>	rough-fruited amaranth	native	forb	3	OBL	2
<i>Ambrosia artemisiifolia</i>	annual bur-sage	native	forb	0	FACU	3
<i>Carduus acanthoides</i>	plumeless thistle	non-native	forb	0	UPL	2
<i>Chenopodium simplex</i>	maple-leaved goosefoot	native	forb	1	UPL	3
<i>Cirsium arvense</i>	Canada thistle	non-native	forb	0	FACU	2
<i>Cirsium vulgare</i>	bull thistle	non-native	forb	0	FACU	3
<i>Conyza canadensis</i>	Canadian horseweed	native	forb	0	FACU	3
<i>Daucus carota</i>	Queen Anne's-lace	non-native	forb	0	UPL	2
<i>Echinochloa crus-galli</i>	barnyard grass	non-native	grass	0	FAC	3
<i>Elymus virginicus</i>	common eastern wild-rye	native	grass	6	FACW	1
<i>Erechtites hieraciifolius</i>	American burn-weed	native	forb	2	UPL	3
<i>Erigeron annuus</i>	annual fleabane	native	forb	0	FACU	2
<i>Eriochloa villosa</i>	Chinese cup grass	non-native	grass	0	UPL	3
<i>Panicum dichotomiflorum</i>	fall panic grass	native	grass	0	FACW	5
<i>Pastinaca sativa</i>	wild parsnip	non-native	forb	0	UPL	1
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	3
<i>Rumex crispus</i>	curly dock	non-native	forb	0	FAC	3
<i>Salix interior</i>	sandbar willow	native	shrub	2	FACW	2
<i>Setaria faberi</i>	giant foxtail	non-native	grass	0	FACU	4
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	2
<i>Sonchus arvensis</i>	field sow-thistle	non-native	forb	0	FACU	1
<i>Sonchus asper</i>	prickly sow-thistle	non-native	forb	0	FACU	2
<i>Symphotrichum pilosum</i>	frost aster	native	forb	1	FACU	2

FQA Metrics	Species Richness	Mean C Value	FQI
Native	11	1.5	5.0
All Species	24	0.7	3.4

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-8. Upland Meadow 1 (UPL1) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Acer saccharinum</i>	silver maple	native	tree	2	FACW	1
<i>Ambrosia artemisiifolia</i>	annual bur-sage	native	forb	0	FACU	2
<i>Asclepias syriaca</i>	common milkweed	native	forb	1	UPL	1
<i>Bromus inermis</i>	Hungarian brome	non-native	grass	0	UPL	2
<i>Daucus carota</i>	Queen Anne's-lace	non-native	forb	0	UPL	2
<i>Erigeron annuus</i>	annual fleabane	native	forb	0	FACU	2
<i>Festuca arundinacea</i>	reed fescue	non-native	grass	0	FACU	2
<i>Juglans nigra</i>	black walnut	native	tree	3	FACU	1
<i>Kuhnia eupatorioides var. corymbulosa</i>	false boneset	native	forb	5	UPL	2
<i>Lotus corniculatus</i>	bird's-foot trefoil	non-native	forb	0	FACU	3
<i>Morus alba</i>	Russian mulberry	non-native	tree	0	FACU	1
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	7
<i>Poa pratensis</i>	Kentucky bluegrass	non-native	grass	0	FACU	3
<i>Populus deltoides</i>	eastern cottonwood	native	tree	2	FAC	2
<i>Securigera varia</i>	crown-vetch	non-native	forb	0	UPL	2
<i>Setaria faberi</i>	giant foxtail	non-native	grass	0	FACU	2
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	5
<i>Sonchus arvensis</i>	field sow-thistle	non-native	forb	0	FACU	3
<i>Symphyotrichum lateriflorum</i>	side-flowering aster	native	forb	3	FAC	1
<i>Symphyotrichum novae-angliae</i>	New England aster	native	forb	3	FACW	1
<i>Symphyotrichum pilosum</i>	frost aster	native	forb	1	FACU	3
<i>Tanacetum vulgare</i>	common tansy	non-native	forb	0	FACU	2
<i>Taraxacum officinale</i>	common dandelion	non-native	forb	0	FACU	2
<i>Trifolium pratense</i>	red clover	non-native	forb	0	FACU	2
<i>Vitis riparia</i>	frost grape	native	vine	2	FAC	1

FQA Metrics	Species Richness	Mean C Value	FQI
Native	12	1.9	6.6
All Species	25	0.9	4.5

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-9. Upland Meadow 2 (UPL2) Species List

Scientific Name	Common Name	Native	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Abutilon theophrasti</i>	piemarker	non-native	forb	0	FACU	2
<i>Arctium minus</i>	common burdock	non-native	forb	0	FACU	3
<i>Asclepias syriaca</i>	common milkweed	native	forb	1	UPL	2
<i>Cirsium arvense</i>	Canada thistle	non-native	forb	0	FACU	2
<i>Cornus racemosa</i>	gray dogwood	native	shrub	2	FAC	2
<i>Daucus carota</i>	Queen Anne's-lace	non-native	forb	0	UPL	3
<i>Elymus canadensis</i>	Canada wild-rye	native	grass	4	FACU	1
<i>Erigeron annuus</i>	annual fleabane	native	forb	0	FACU	1
<i>Heliopsis helianthoides</i>	false sunflower	native	forb	5	FACU	2
<i>Lonicera x bella</i>	Bell's honeysuckle	non-native	shrub	0	FACU	2
<i>Monarda fistulosa</i>	bee balm	native	forb	3	FACU	2
<i>Parthenium integrifolium</i>	American feverfew	native	forb	8	UPL	1
<i>Pastinaca sativa</i>	wild parsnip	non-native	forb	0	UPL	2
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	4
<i>Poa pratensis</i>	Kentucky bluegrass	non-native	grass	0	FACU	3
<i>Populus deltoides</i>	eastern cottonwood	native	tree	2	FAC	1
<i>Prunus americana</i>	American plum	native	shrub	3	UPL	2
<i>Prunus serotina</i>	wild black cherry	native	tree	3	FACU	1
<i>Ratibida pinnata</i>	globular coneflower	native	forb	4	UPL	4
<i>Robinia pseudoacacia</i>	black locust	non-native	tree	0	FACU	4
<i>Rudbeckia hirta</i>	black-eyed Susan	native	forb	4	FACU	1
<i>Rumex crispus</i>	curly dock	non-native	forb	0	FAC	1
<i>Securigera varia</i>	crown-vetch	non-native	forb	0	UPL	5
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	5
<i>Solidago rigida</i>	rigid goldenrod	native	forb	5	FACU	2
<i>Symphotrichum lanceolatum</i>	panicled aster	native	forb	4	FACW	2
<i>Symphotrichum novae-angliae</i>	New England aster	native	forb	3	FACW	3
<i>Symphotrichum pilosum</i>	frost aster	native	forb	1	FACU	2
<i>Taraxacum officinale</i>	common dandelion	non-native	forb	0	FACU	2
<i>Vitis riparia</i>	frost grape	native	vine	2	FAC	2

FQA Metrics	Species Richness	Mean C Value	FQI
Native	18	3.1	13.2
All Species	30	1.8	9.9

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-10. Upland Meadow 3 (UPL3) Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Acer negundo</i>	box elder	native	tree	0	FAC	3
<i>Agrostis gigantea</i>	redtop	non-native	grass	0	FACW	3
<i>Bromus inermis</i>	Hungarian brome	non-native	grass	0	UPL	2
<i>Cirsium arvense</i>	Canada thistle	non-native	forb	0	FACU	2
<i>Dactylis glomerata</i>	orchard grass	non-native	grass	0	FACU	5
<i>Daucus carota</i>	Queen Anne's-lace	non-native	forb	0	UPL	5
<i>Erigeron annuus</i>	annual fleabane	native	forb	0	FACU	2
<i>Festuca arundinacea</i>	reed fescue	non-native	grass	0	FACU	5
<i>Helianthus strumosus</i>	pale-leaved woodland sunflower	native	forb	4	FACU	2
<i>Lotus corniculatus</i>	bird's-foot trefoil	non-native	forb	0	FACU	3
<i>Miscanthus sacchariflorus</i>	Amur silver grass	non-native	grass	0	UPL	2
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	3
<i>Robinia pseudoacacia</i>	black locust	non-native	tree	0	FACU	2
<i>Rubus idaeus var. strigosus</i>	American red raspberry	native	shrub	3	FAC	2
<i>Securigera varia</i>	crown-vetch	non-native	forb	0	UPL	5
<i>Solidago canadensis</i>	Canadian goldenrod	native	forb	1	FACU	4
<i>Symphotrichum lateriflorum</i>	side-flowering aster	native	forb	3	FAC	2
<i>Symphotrichum novae-angliae</i>	New England aster	native	forb	3	FACW	1
<i>Symphotrichum pilosum</i>	frost aster	native	forb	1	FACU	2
<i>Trifolium pratense</i>	red clover	non-native	forb	0	FACU	2
<i>Vitis riparia</i>	frost grape	native	vine	2	FAC	2

FQA Metrics	Species Richness	Mean C Value	FQI
Native	9	1.9	5.7
All Species	21	0.8	3.7

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%

Table D-11. Upland Woodland Species List

Scientific Name	Common Name	Nativity	Physiognomy	Coefficient of Conservatism	NC-NE Wetland Indicator	Cover Class
<i>Acer negundo</i>	box elder	native	tree	0	FAC	4
<i>Acer saccharinum</i>	silver maple	native	tree	2	FACW	4
<i>Ageratina altissima</i>	white snakeroot	native	forb	1	FACU	3
<i>Ambrosia trifida</i>	giant ragweed	native	forb	0	FAC	1
<i>Arctium minus</i>	common burdock	non-native	forb	0	FACU	3
<i>Bromus inermis</i>	Hungarian brome	non-native	grass	0	UPL	3
<i>Dactylis glomerata</i>	orchard grass	non-native	grass	0	FACU	4
<i>Eriochloa villosa</i>	Chinese cup grass	non-native	grass	0	UPL	2
<i>Geum canadense</i>	white avens	native	forb	2	FAC	3
<i>Hackelia virginiana</i>	beggar's-lice	native	forb	3	FACU	3
<i>Juglans nigra</i>	black walnut	native	tree	3	FACU	4
<i>Leonurus cardiaca</i>	motherwort	non-native	forb	0	UPL	1
<i>Lonicera x bella</i>	Bell's honeysuckle	non-native	shrub	0	FACU	5
<i>Panicum dichotomiflorum</i>	fall panic grass	native	grass	0	FACW	2
<i>Parthenocissus quinquefolia</i>	Virginia creeper	native	vine	5	FACU	1
<i>Persicaria virginiana</i>	jumpseed	native	forb	7	FAC	1
<i>Phalaris arundinacea</i>	reed canary grass	non-native	grass	0	FACW	2
<i>Pilea pumila</i>	Canadian clearweed	native	forb	3	FACW	2
<i>Rhamnus cathartica</i>	common buckthorn	non-native	shrub	0	FAC	2
<i>Ribes cynosbati</i>	dogberry	native	shrub	3	FACU	1
<i>Robinia pseudoacacia</i>	black locust	non-native	tree	0	FACU	5
<i>Rubus allegheniensis</i>	Allegheny blackberry	native	shrub	2	FACU	1
<i>Rubus idaeus var. strigosus</i>	American red raspberry	native	shrub	3	UPL	2
<i>Rubus occidentalis</i>	black-cap	native	shrub	2	UPL	2
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	native	forb	7	FACU	1
<i>Setaria faberi</i>	giant foxtail	non-native	grass	0	FACU	2
<i>Solidago gigantea</i>	giant goldenrod	native	forb	3	FACW	1
<i>Symphotrichum lateriflorum</i>	side-flowering aster	native	forb	3	FAC	2
<i>Urtica dioica</i>	stinging nettle	native	forb	1	FAC	3
<i>Verbena urticifolia</i>	nettle-leaved vervain	native	forb	2	FAC	1
<i>Viola sororia</i>	common blue violet	native	forb	3	FAC	3

FQA Metrics	Species Richness	Mean C Value	FQI
Native	21	2.6	11.9
All Species	31	1.8	10.0

Cover Classes:	
1	<1%
2	1-5%
3	5-10%
4	10-25%
5	25-50%
6	50-75%
7	75-100%