

January 17, 2023

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**RE: Conservation Enhancements Draft Concept Scope of Work, Calhoun Road Property, New Berlin, WI**

Dear Ryan:

Heartland has prepared this Conservation Enhancements Draft Concept Scope of Work for the proposed Calhoun Road Property residential development in the City of New Berlin (the "Project"). The Project site is located on 88.50 acres northeast of the intersection of Calhoun Road and Beloit Road.

The plan was developed to provide you with a concept to enhance existing natural areas in alignment with development of the Project site as a conservation subdivision. Heartland understands enhancements are also desired to enhance overall aesthetics and viewsheds of vegetation growing near the proposed residential development. Current land use at the Project site is active agricultural fields and natural areas of generally low quality, including secondary environmental corridor, upland shrubby thickets, and wooded and open wetlands associated with lowlands along Muskego Creek.

Heartland understands that residential lots are proposed in the main existing agricultural area off Calhoun Road, as depicted on "Proposed Sketch Plan 1" prepared by Trio Engineering (dated 8/23/2022). Approximately the eastern half of the Project site will not be developed.

## **PROJECT SITE CONDITIONS**

Heartland conducted site visits in late fall and early winter 2022 to review options for enhancements in the eastern half of the Project site. While these reviews do not constitute a thorough natural area inventory, data gathered were used to inform potential enhancement opportunities. As with any ecological restoration, Heartland recommends that proposed enhancement activities be adjusted based on new knowledge of site conditions as well as ecological response of the site throughout the process.

The site reviews revealed that the natural areas in the eastern half of the Project site are heavily degraded. A combination of agricultural land use, hydrologic alteration, and prevalence of invasive species has contributed to loss of native vegetation and creation of sharp gradients between active farm fields and natural area borders. In addition, the site has experienced significant tree mortality in the wooded wetlands along ditched Muskego Creek due to Emerald ash borer and Dutch elm disease.



In general, enhancement activities are not recommended along the extensive wetland complex along the open portion of ditched Muskego Creek. Long-term control of invasive vegetation in these areas would be challenging due to hydrologic alteration, recent abrupt loss of tree canopy, and predominance of invasive species in nearby areas. Therefore, for the purposes of developing this concept, Heartland focused on the degraded natural areas immediately bordering the proposed residential development as well as the southeast portion of the Project site where a mowed walking path is proposed as part of the conservation development.

### **Existing Site Conditions**

Heartland identified potential enhancement units based on existing conditions. A total of 4 units were mapped; each is summarized below. Evaluation of these 4 units formed the basis for the draft concept scope of work tasks and associated opinion of probable cost.

#### **Unit 1**

Unit 1 is 4.73 acres and consists of unassociated woody growth dominated overall by invasive common buckthorn and exotic bush honeysuckles, cultivated apple trees, and generally weedy native trees. The herbaceous ground layer is generally lacking due to dense shading and is weedy in nature. The northern boundary of Unit 1 was placed 50 feet south of the property boundary to maintain a wooded screen to existing residential lots to the north.

Unit 1 transitions to the east to degraded wetland complex associated with Muskego Creek. Froedtert Moorland Reserve Health Center is located about 2,200 feet to the east of the eastern extent of Unit 1. The upper floors of the main building were visible through gaps in trees/shrubs in the wetland east of Unit 1 during the early winter site visit. Existing shrubs and trees in wooded-wet meadow-shallow marsh wetland complex to the east of Unit 1 would be expected to provide some screening function from the health center, especially during the growing season (leaf-on). However, Heartland understands an important consideration will be to preserve native shrubs (e.g., select hawthorns, dogwoods, etc.) and trees (e.g., black cherry, black walnut, slippery elm, etc.) in Unit 1 to provide screening. Unit 1 was further broken down into sub-units for overall planning:

#### Unit 1A

Unit 1A is a 1.63-acre shrub thicket with widely scattered small to medium trees, including dead ash. Exotic bush honeysuckle is very dense throughout the unit.

#### Unit 1B

Unit 1B is a 3.10-acre shrub thicket with scattered small to medium trees, with greater coverage of tall shrub and tree canopy than Unit 1A. Common buckthorn is very dense, especially in the western portion, and large in stature. A wooded wetland is present in the southern portion. Unit 1B abruptly transitions to agricultural field to the west and planted white cedar screen (Unit 2) to the south.

#### **Unit 2**

Unit 2 is 1.25 acres and consists of a mature planting of white cedar trees (*Thuja occidentalis*) situated between a north-south ditch and agricultural field. Common buckthorn is dense immediately along the field edge and scattered elsewhere within the unit. Dead ash is scattered throughout. Herbaceous ground layer is generally lacking due to dense shading



from white cedar. Heartland recommends that the visual screening and natural interest of the white cedar should be preserved as part of the proposed enhancements.

### **Unit 3**

Unit 3 is 5.75 acres and consists of degraded wooded wetlands associated with ditched Muskego Creek. Dead standing green ash trees are abundant with other scattered native trees (willow, cottonwood) along with native and invasive shrubs. Dead ash is present up to the field edge and ash are actively breaking apart and falling into the field edge. Herbaceous ground layer is generally weedy/invasive in nature, with reed canary grass (*Phalaris arundinacea*) abundant in open areas. Unit 3 transitions to a large degraded wooded-wet meadow-shallow marsh wetland complex to the northeast. Unit 3 was further broken down into sub-units for overall planning:

#### Unit 3A

Unit 3A is a 1.81-acre primarily wooded wetland north of a farm culvert crossing and west of Muskego Creek. Dead ash is abundant but mostly still standing. Invasive common buckthorn is abundant along the edges. A seepage (artesian) wetland (degraded sedge meadow) is present in the northeast portion and is an important feature for ecological enhancement.

#### Unit 3B

Unit 3B is a 2.10-acre wooded wetland along the edge of an existing farm field. Standing dead ash are abundant and beginning to fall into the adjacent field edge. This area is also likely routinely inundated or flooded due to backwatering upstream of the farm culvert crossing. As a mowed walking path is proposed in the farm field to the southeast (Unit 4), the primary purpose of including this unit was to manage hazard trees that would likely eventually fall into Unit 4.

#### Unit 3C

Unit 3C is a 1.30-acre wooded wetland along ditched Muskego Creek and situated between two farm fields. The area contains a mix of native and non-native (invasive) trees and shrubs. Large stature invasive common buckthorn is prevalent on ditch spoils. Scattered native shrubs and trees would be expected to provide screening for residential lots to the south, especially in the growing season. Herbaceous ground layer is overall lacking or is weedy/invasive in nature.

#### Unit 3D

Unit 3D is a 0.54-acre wooded edge along the southern edge of the main farm field. It borders a pine plantation to the south on the adjacent property. Native and non-native (invasive) trees and shrubs are present. The primary purpose of including this unit is to manage a transition between proposed conservation lots to the north and wooded lands to the south on the adjacent property.

### **Unit 4**

Unit 4 is 8.83 acres and comprises the existing farm field in the southeast portion of the Project site. A mowed path walking trail is proposed for this area on the "Proposed Sketch Plan 1". Given the existing agricultural land use (soybeans in 2022), this area is a prime candidate for prairie restoration since ongoing cultivation provides a highly suitable seedbed requiring minimal, if any, preparation prior to native seeding. Prairie restoration would align well with overall Project conservation goals and the proposed mowed path walking trail.



## **DRAFT CONCEPT SCOPE OF WORK**

Heartland developed work tasks for ecological enhancements within Units 1-4 that we feel are achievable following industry standard methods and that align with the Project goals and existing site conditions stated above. These tasks may be used to inform development of a scope of services.

### **Task 1: Site Conservation and Stewardship Plan**

Heartland recommends preparing a site conservation and stewardship plan to guide all enhancement activities. While the bulk of the effort and costs for a project of this type are associated with the first five years, or implementation period, restored natural areas also require long-term management (stewardship) to maintain native plants and to minimize weedy and invasive species. This plan will also provide important background information and guide long-term management by the homeowner's association (HOA). Plan components would consist of the following:

1. Introduction, purpose statement, goals, and objectives;
2. Summary of existing conditions;
3. Detailed enhancement plan consisting of restoration unit descriptions, restoration activities, proposed conditions, and maps; and
4. Methods and schedule for enhancement activities:
  - a. Implementation (years 1-5): clearing, site preparation for native seeding, native seed mixes and seed installation, and grow-in maintenance methods including routine mowing and selective herbicide applications;
  - b. Supplemental native shrub and tree planting (as needed for screening);
  - c. Long-term stewardship: selective herbicide applications, prescribed burning, and supplemental (as-needed) native seeding;
  - d. Routine monitoring protocols to assess goals and objective and to inform long-term adaptive management plans;
  - e. Budget; and
  - f. Benefits and talking points of natural area restoration, as well as opportunities for third-party recognition, for use by the HOA.

### **Task 2: Weedy and Hazard Shrub and Tree Removals (Project Year 1 Winter)**

Given the existing site conditions and prevalence of weedy and invasive woody vegetation, Heartland recommends selective removal of invasive shrubs and trees. This would enhance aesthetics (e.g., removal of dead ash from wooded wetland edges), create more natural-looking transitional zones adjacent to the proposed residential development, and prepare areas for conversion to native vegetation which would provide numerous conservation benefits. Heartland recommends clearing on a total of 11.73 acres during frozen ground conditions. The recommended clearing extents are approximated as follows:

- Unit 1 (1A and 1B): total 4.73 acres
  - The northern extent starts 50 feet south of northern property boundary to maintain a wooded screen, south to Unit 2.
  - Eastern edge of field east to the wooded-wet meadow-shallow marsh wetland complex.
- Unit 2: planted cedars north and west of a ditch; 1.25 acres
- Unit 3: total 5.75 acres



- 3A: eastern field edge to ditched Muskego Creek; 1.81 acres.
- 3B: 75 feet into wooded wetland from field edge; 2.10 acres.
- 3C: entire wooded area along ditched Muskego Creek between farm fields; 1.30 acres.
- 3D: southern field edge to southern property boundary; 0.54 acres.

Clearing would be conducted using the following methods:

- Prior to clearing, marking of trees and shrubs to preserve for screening and habitat by an Ecologist.
- Remove all target non-native shrubs and aggressive native shrubs. All other non-native shrubs would be preserved.
- Selectively remove non-native and hazard trees. Other trees would be left for screening.
- Cutting using a forestry mower (for target shrubs and small trees) and chainsaws (for target trees). A skidsteer with grapples would be used to move cut materials to burn pile locations.
- On-site disposal of cut material in brush piles in coordination with the City and/or local fire department prior to operation of burn piles (note the City of New Berlin has a burning ordinance that would be restrictive to operation of larger burn piles and prescribed burning, so additional approvals would be needed for this approach). When possible, burn piles would be placed in open areas (adjacent field edges).
- Stumps of living shrubs and trees would be treated with an appropriate herbicide formulation following cutting of live trees and shrubs to reduce re-growth.

### **Task 3: Native Seeding Southeast Field (Unit 4) (Project Year 1 Winter)**

This task would include coordination to install a native prairie seed mix into the 8.83-acre southeast field. The preferred seedbed is soybean stubble, like what was present in the 2022 growing season, as prairie establishment is typically enhanced in this scenario. As such, Heartland assumes that no seedbed preparation would be required prior to seed installation. A site-specific native seed mix would be designed and procured from a reputable native seed vendor assuming a seed budget of \$800 per acre. The native seed would be installed by winter broadcasting into crop stubble (soybean preferred).

### **Task 4: Site Preparation and Stewardship (Project Year 1-2 Growing Season)**

Given the existing highly degraded conditions, a favorable native seedbank response is not anticipated following clearing. Based on our experience, proliferation of weedy and invasive species is likely to occur in the first growing season following clearing. As such, additional site preparation would be required prior to native seed installation in areas that are cleared, specifically Unit 1 (1A and 1B) and Unit 3 (3A, 3C), total of 7.84 acres. Site preparation and stewardship would be completed according to the following:

- Two broadcast non-selective herbicide applications in each of year 1 and year 2 (4 total), following clearing, to target woody re-sprouts and weedy herbaceous growth on 7.84 acres.
  - Herbicides would be selected based on target species and site conditions.
  - Herbicides would be applied using a combination of backpack sprayers and ATV/UTV-mounted pistol or boom sprayers.



- Native seed would not be installed at Units 2, 3B, and 3D, total of 3.89 acres. Instead, general stewardship would be conducted in these areas, consisting of selective herbicide applications to target woody re-sprouts and other weedy / invasive species, concurrently with work at Unit 1 and elsewhere within Unit 3.
- At Unit 4, 8.83 acres, grow-in maintenance would be conducted consisting of management mowing and selective herbicide applications in the growing season following seeding. Prairie plants are slow to establish from seed and require open (high light) conditions, so management is required to enhance prairie establishment, consisting of the following:
  - Management mowing to minimize seeding of volunteer weedy annual vegetation and to maintain short-stature vegetation to promote germination and growth of prairie seedling, as follows:
    - 4 times in the growing season following seeding (Project year 1) and
    - 2 times in the second growing season following seeding (Project year 2)
  - Selective herbicide applications, consisting of targeted applications from backpack sprayers to target biennial and perennial invasive species, one time per growing season following seeding in Project year 1 and 2.

#### **Task 5: Native Seeding Select Cleared Areas (Project Year 2/3 Winter)**

Once Unit 1 (1A and 1B) and Unit 3 (3A, 3C), total of 7.84 acres, are adequately prepared for native seed, a site-specific native seed mix would be designed and procured from a reputable native seed vendor assuming a seed budget of \$800 per acre. Native seed would be installed by winter broadcasting.

#### **Task 6: Grow-in Maintenance and Stewardship (Project Years 3-5)**

By Project year 3, it is expected that all 20.56 acres would be undergoing grow-in maintenance or stewardship, consisting of:

- Continuation of grow-in maintenance at Unit 4, total of 8.81 acres, to establish native seed;
- General stewardship of Unit 2 and Unit 3 (3B, 3D), total of 3.89 acres; and
- Grow-in maintenance of Unit 1 (1A and 1B) and Unit 3 (3A, 3C), total of 7.84 acres, to establish native seed.

Ongoing grow-in maintenance and stewardship of all 20.56 acres would likely follow the tasks below:

- Years 3 and 4: one mowing trip per year to cover up to 10 acres, or 2 mowings total for Project years 3-5.
- Years 3 and 4: two selective herbicide application trips per year to cover up to 20.56 acres, or 4 total trips for Project years 3-4.
- Year 5:
  - One selective herbicide application to cover up to 20.56 acres and
  - Prescribed burn plan development and execution of a prescribed burn in Units 1, 3A, 3C, and 4, total of 16.67 acres, in spring of Project year 5.

A report would be provided at the end of year consisting of the following:



- Summary of work completed,
- Brief assessment of site conditions and notable observations,
- Assessment of goals and objectives,
- Adaptive management recommendations, and
- Proposed budget for the following year,

## OPINION OF PROBABLE COST

Heartland has prepared an opinion of probable cost, broken down by year and work unit, to execute the Draft Concept Scope of Work (Table 1). Given the dynamic nature of ecological restoration of degraded sites, Heartland recommends reviewing costs on an annual basis to adjust based on latest goals and objectives and to response to adaptive management needs.

**Table 1.** Opinion of Probable Cost Breakdown

Year	Work Summary	Area	Cost Estimate
0	Task 1: Site Conservation and Stewardship Plan	All areas	\$5,000
1	Task 2: Shrub and Tree Removals	11.73 acres (Units 1,2,3)	\$50,750
	Task 3: Native Seeding SE Field	8.83 acres (Unit 4)	\$12,050
	Task 4: Site Preparation and Stewardship	Site prep: 7.84 acres (Units 1,3A, 3C) Stewardship: 12.72 acres (Units 2,3B,3D,4)	\$18,500
2	Task 4: Site Preparation and Stewardship	Site prep: 7.84 acres (Units 1,3A, 3C) Stewardship: 12.72 acres (Units 2,3B,3D,4)	\$18,900
	Task 5: Native Seeding Cleared Areas	7.84 acres (Units 1,3A,3C)	\$11,800
3	Task 6: Grow-in Maintenance and Long-term Stewardship	20.56 acres (all units)	\$22,500
4	Task 6: Grow-in Maintenance and Long-term Stewardship	20.56 acres (all units)	\$23,200
5	Task 6: Grow-in Maintenance and Long-term Stewardship	20.56 acres (all units)	\$19,850
<b>TOTAL</b>			<b>\$182,550</b>

By year 6, annual long-term stewardship costs would be expected to decline to \$7,000-\$12,000 per year, with costs on the higher end when prescribed burns are conducted.

## ADDITIONAL ENHANCEMENT OPPORTUNITIES

### Screening

As screening is an important consideration for this Project, an additional option would be to plant small groupings of desirable native trees and shrubs (swamp white oak, bur oak, elderberry, nannyberry) once the native herbaceous layer is established. Heartland recommends determining additional screening needs (e.g., gaps) after clearing of invasive trees and shrubs.



### **Other Potential Conservation Areas**

Heartland reviewed the "Proposed Sketch Plan 1" prepared by Trio Engineering (dated 8/23/2022) to gain a better understanding of the potential other conservation activities that may be possible within the site. Heartland recommends blending these with the existing natural communities to provide a large block of conserved and restored natural areas surrounding the residential lots and trails.

### **Stormwater Ponds and Bypass Swale**

The stormwater ponds and bypass swale provide an opportunity to establish additional areas of native plant communities in standing water (retention), on pond slopes, and in adjacent open spaces at the top of slope. Following grading, the restoration process is similar as described above for Unit 4. This would allow for a blending of natural habitats with existing natural communities to the east (Units 1-3).

### **Conservation Lot and East Ag Field**

Depending on the final site design, the area mapped as Conservation Lot on the above-referenced sketch plan, as well as the 100-year floodplain in the eastern portion of the main agricultural field (east of lots 12-19), is a good candidate for prairie restoration. As existing land use is primarily agriculture, the process described above for Unit 4 would apply here as well. This would allow for a blending of natural habitats with enhanced natural communities to the east (Units 1-3).

### **Open Space Along Western Lots**

The open spaces along the western lots (lots 2-6 and 20-22) provide an additional opportunity to establish a low, growing compatible native plant community, such as short prairie, or mixed prairie and no-mow turf grasses. Assuming these areas are graded, the restoration approach would follow the other areas described above.

Heartland is happy to work with you, the Project engineer, and Project architect to refine concepts and enhancements scope of work for all potential conservation areas.

Sincerely,

Aaron Feggstad, Senior Ecologist  
Heartland Ecological Group, Inc.  
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262-354-4976

Cc: Eric Parker, Heartland; Jeff Kraemer, Heartland

Enclosures: Mark-up of Site Plan

**ADJUSTED TRACT ACREAGE**

DESCRIPTION	Total Area	Adjustment Factor	Adjusted Total Area Deduction	ADJUSTED TRACT ACREAGE
	(acres)	(deduction)	(acres)	(acres)
<b>CALHOUN RD.</b>	<b>88.50</b>			
- Wetlands (outside Floodway)	13.26	-0.95	-12.60	
- Floodway	21.86	-1.00	-21.86	
- Floodplain	4.91	-0.50	-2.46	
- Steep Slopes (>20%)	0.12	-0.80	-0.10	
- Moderately Steep Slopes (15%-20%)	0.68	-0.60	-0.41	
<b>TOTAL ADJUSTED TRACT ACREAGE</b>				<b>51.08</b>
<b>Required conservation area (75% of adjusted)</b>				<b>38.31</b>
<b>LOT COUNT BASED ON ADJUSTED TRACT ACREAGE</b>				<b>10</b>

Per 275-33-D (12)(a) The subdivision must include at least 75% of the adjusted tract acreage as conservation area.  
 Conservation area shall not be used for residential lots, except 70% of the area may be 10 acre or larger "conservation lots".

**DENSITY CALCULATION**

Description	Total Area (acres)	Allowable Lots	Notes
<b>TOTAL AREA "4908 S CALHOUN RD"</b>	<b>88.50</b>	<b>17.7</b>	Total area excludes the Calhoun Road right-of-way
<b>LARGE TRACT DENSITY BONUS (88.5 acres - 50 acres)</b>	38.50	<b>3.9</b>	Large Tract density bonus applies to tracts >50 acres in size, calculated as 1 additional lot for every 10 acres of total tract acreage above 50 acres in the R-1/R-2 District. The 27.8 acres of Wetlands on the site are given to be part of the first 50 acres excluded from the bonus.
<b>TOTAL CONSERVATION SUBDIVISION APPLICATION</b>	<b>88.50</b>	<b>22</b>	Maximum # of possible lots in the conservation subdivision.

**PROPOSED ZONING**

**R1/R2 ZONING REQUIREMENTS per Table 275-33-2**

Conservation Subdivision	Lot Area* (s.f.)	Lot Width** (ft)	Lot Depth (ft)	Front & Rear (ft)	Side (ft)	Wetland (ft)
R-1/R-2	20,000 or 32,670	110 or 130	None	40	15	30

\* Minimum Lot Area may be 20,000 s.f. when septic system is located entirely off-lot; Minimum Lot Area when septic system is located on-lot is 32,670 s.f.

\*\* Minimum lot width of 110' applies to homes with front loaded garages; Minimum Lot Width of 130' applies to homes with side loaded garages.

**ADDITIONAL DESIGN STANDARDS per 275-33**

- Conservation Area Buffer: Existing Road = 100'; Exterior Boundary = 50'
- Conservation Area:
  - Includes Secondary Environmental Corridor, Floodplain and Wetland
  - No less than 30% of adjusted tract acreage shall be for common use
  - May be located on lots that are 10 acres or larger.

**Bonus Lot Evaluation**  
 - Required Conservation Area = 38.31 ac (75% of Adjusted Tract Acreage)  
 - Open Space Calculations:  
 - Total Adjusted Tract Acreage = 51.08 ac  
 - Proposed Road R/W = -3.52 ac  
 - Lot Area (21 lots) = -19.82 ac  
 - Conservation Lot (1 lot) = -0  
 - Adjusted Conservation Area = 27.74 ac  
 - 1 Bonus Lot / 5 acres is available if/when the Adjusted Conservation Area provided is greater than the Required Conservation Area.  
 - 28.14 ac < 38.31 ac = No Bonus Lot

Additional potential enhancement opportunities pending final site design



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**DEVELOPMENT SUMMARY**

- Total Gross Area:	88.5 ac
- Proposed Zoning:	R-1/R-2 Conservation Subdivision
- Proposed Development:	22 lots
<b>CONSERVATION AREA</b>	
- Total Common Area (OL 1 & OL 2) =	54.84 ac
- S.E.C. on Lot 11 =	5.48 ac
- Total Conservation Area =	60.32 ac
<b>Road Length:</b>	
- Entry Boulevard =	100'
- Rural Road =	1,420'
- Cul-de-Sac Bulc =	330'

Scale: 1" = 150' (22"x34")  
 Scale: 1" = 300' (11"x17")  
 DATE: 08-23-2022

**PROPOSED SKETCH PLAN 1**  
**Calhoun Road Property**  
 City of New Berlin, WI



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